

NetworkWorld

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June 21, 2004 ■ Volume 21, Number 25

A Wider Net

For the record: Guinness book open to industry's greatest hits

Traditional fare still there, but so are wireless LANs, 'Net cafes.

■ BY BOB BROWN

David Hawksett doesn't particularly care if you can juggle chain-saws or pop your eyeballs a half-inch out of their sockets. But zip a multi-gigabyte file across an intercontinental network or show him the first electronic message, and you'll get his attention.

"The public has an appetite for science and technology, especially when it's well explained and presented," says the 31-year-old Hawksett, who for the past four years has served as the *Guinness World Records* book's first full-time science and technology editor.

See Guinness, page 102

Tester's Challenge:

VoIP security tools are lacking

RESPONSE: Cisco and Avaya weigh in with their perspectives and solutions.

In our most recent Tester's Challenge published late last month, (www.nwfusion.com, DocFinder: 2546) Network World Lab Alliance partner Ed Mier charged that VoIP vendors — Cisco and Avaya, in particular — need to simplify the state of securing VoIP networks. Specifically, Mier called on vendors to make VoIP security education and technical assistance more readily available and to offer better tools for setting global VoIP security parameters.

See Challenge, page 20

Cisco raising router security

■ BY PHIL HOCHMUTH

Cisco will announce availability of its Network Admission Control security technology for Cisco routers this week and lay out a

road map for adding NAC capabilities to its lines of LAN switches.

These technologies coupled with the fact that later this year the company plans to offer NAC to standards bodies and other vendors could lead to automated network security on every desktop, preventing PCs from spreading harmful traffic.

But with the most critical phase of NAC — LAN switch support — and standardization plans not due out until early 2005, some observers say Cisco is not meeting users' immediate security needs. Also, enterprise users say a standards-based technology is needed sooner for securing LANs and WANs.

First announced last November, NAC is supposed to make every piece of Cisco gear a security enforcement point, where client machines must meet security and policy criteria to access a router

See Cisco, page 16

New realities roiling telecom mean everything is changing

■ BY JIM DUFFY

Leo Dashevskiy, director of IT at Ryla Teleservices, signed up for AT&T's VoIP service and says he realized one immediate benefit: "We're saving a lot of money."

Ryla, a provider of contact center services, now pays a fixed monthly price for voice instead of per-minute charges. The company also needs half as many T-1 access links because each VoIP T-1 can carry 46 to 48 voice channels vs. the 23 or 24 in a traditional T-1.

In all, VoIP has allowed Ryla to shave 30% off its telecom expenses. It's also ushering in a new way for AT&T and other carriers to do business.

■ Telecom's biggest U.S. show, Supercomm, hits Chicago, and the mood's upbeat. Page 12.

Broadband, wireless and IP services such as VoIP are disrupting the established order of the telecom industry. Carrier business models are being shaken. Regulatory frameworks are collapsing. The way businesses buy and are charged for services and interact

electronically is fundamentally changing.

"Cellular has taught us that you should be able to do whatever you want from wherever you want," says Jeffrey Blumenfeld, a partner at law firm Crowell & Moring in Washington, D.C. "The Internet taught us that you should be able to get whatever you're looking for no matter where it is.

See Upheaval, page 18

Video Portal Power

Companies are boosting corporate communications, helping teams work together, cutting costs and even generating revenue through video portals.

Page 81

STEVEN VOTE

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Dave Chacon
Manager, Technical Services, *PING*

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Belkin's Powerline Ethernet Adapter connects your computer via Ethernet cable to a home network. Page 76.

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Video portal power

Companies are using video portals to stream presentations to employees, enhance collaboration and cut travel costs. **Page 81.**

Sector Spotlight

Grid computing takes flight. **Page 87.**

CLEAR CHOICE



AirMagnet

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A great way to monitor your wireless LAN. **Page 88.**

NetworkWorldFusion

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Exclusive

Network World Fusion Radio

Nick van der Zweep, director of virtualization and utility computing in the Enterprise Systems Group at HP, is this week's guest. He provides an overview of utility computing technologies and HP's take on the market. **DocFinder: 2535**

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The New Data Center

Rethinking networked IT

In this fourth of a six-part series, we spotlight VoIP's role in the new data center, analyze server virtualization strategies and share Burlington Coat Factory's plans for a grid-based, virtualized future.

Supplement begins after page 38.

Columnists

Wireless Wizards

What are the best ways to secure public-access Wi-Fi? The Wizards answer a reader who wants to know the best approach and what is needed to do it. **DocFinder: 2538**

Nutter's Help Desk

Get your answer from Ron
Columnist Ron Nutter is roaming our forums to answer your questions. If you've got one, post away. **DocFinder: 2539**

Small Business Tech

Remote-access recipes, Part 3
Think your company's too small to need one? Columnist James Gaskin says, "Think again." **DocFinder: 2540**

HomeLAN Adventures

Mailbag: Thoughts on WLAN upgrades
Columnist Keith Shaw asked readers if he should feel guilty about having to upgrade his network to support the latest devices. Readers say he was duped by the vendors. **DocFinder: 2541**

Testing volunteers needed

Network World is looking for enterprise networks to be a part of a test to be conducted on security appliances with firewall, IPS, VPN and policy-based management features. Requirements: a T-1 connection, 10-200 users behind security devices and a willingness to let a security consultant assist in appliance management. Volunteers will have access to all test results. **Contact Christine Burns at cburns@nww.com.**

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News

Bits

Munich officials: Windows out, Linux in

■ The city of Munich made it official last week: It's going with Linux to replace 14,000 Windows-based desktops. The city's decision to consider Linux made headlines last year and forced an 11th-hour incentive-laden appeal from Microsoft CEO Steve Ballmer to stick with Windows. The Munich City Council voted 50 to 29 for the switch to Linux and other open source applications, such as browser and office productivity tools. The city did not provide details on the migration, which it says has a price tag of \$42 million. IBM and Novell, which helped advise on the year-long evaluation, are likely front-runners to supply the technology, observers say. Also last week, the city of Bergen, Norway, chose Novell's Linux technology to help replace Windows and Unix platforms within its IT infrastructure. The city's CIO, Janicke Runshaug Foss, says Linux will provide freedom of choice and major cost savings.

Chambers sweet-talking Nortel

■ Cisco CEO John Chambers last week said he would welcome a partnership with telecom equipment maker Nortel. "I believe in strategic partnerships. I would love to have Nortel as a partner," Chambers said. However, he downplayed the notion that Cisco might buy Nortel. "I don't know how to do large acquisitions," Chambers said, but added, "Never say never." Chambers has said many times that partnerships tend to be less difficult and risky than acquisitions. William Owens, Nortel president and CEO, said he had not talked to Chambers about partnerships but Nortel would be open to discussions.

Cisco patches IOS BGP vulnerability

■ A flaw in Cisco routers and switches running IOS with Border Gateway Protocol enabled could be vulnerable to a denial-of-service attack. To exploit the vulnerability, an attacker would have to inject a malformed BGP packet that appears to be from a trusted peer, a scenario that limits the scope of the problem, according to Cisco. A free update is available at www.nwfusion.com, DocFinder: 2555.

"Dang, I didn't think it would be this hard to get out of my cellular contract early!"

Layer

We've got a friend in Pennsylvania, and it's David Green of Butler, who supplied the above and made all of us who've ever tried to skip out early laugh. Check in each Monday for the start of a new contest. www.nwfusion.com/weblogs/layer8



■ The Good The Bad The Ugly



Following the money. Despite concerns about phishing and other network security issues, online banking is booming. That's according to a comScore Networks survey that shows more than 22 million users logged on to accounts at the top 10 U.S. banks in the first quarter, up 29% from the same time last year. Use of online bill payment services increased 37% over that period, the survey said.



Cell phones targeted. Well, you knew this day would come sooner or later. Security watchers last week confirmed that a proof-of-concept worm has been introduced that propagates via mobile phones running Symbian OS. The good news is that security firms say the worm carries no malicious code. ➤



Akamai gets hit — twice.

A distributed denial-of-service attack last week caused disruptions that affected customers of Internet hosting company Akamai Technologies, including search engine sites. Not missing a beat, rival Mirror Image alerted the press that it had "executives available to comment on why this is bad for the industry and how big companies can protect their Web sites from going dark again."



IBM, MessageLabs offering e-mail service

■ IBM is partnering with MessageLabs to provide a managed e-mail security service that filters messages for viruses, spam and inappropriate content before they reach a company's network. The IBM offering, called E-mail Security Management Services, is based on an existing set of services from MessageLabs called MessageLabs Email Security System. IBM brings to the table its support infrastructure and ongoing input from its research unit for continued improvements to the service, as well as the ability to integrate this e-mail protection service into its other managed security services, the company says. Meanwhile, MessageLabs benefits from exposure for its service through IBM's sales channels.

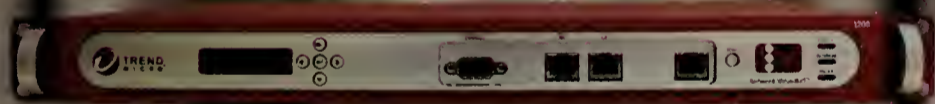
Spyware bill gets boost in House

■ A U.S. House subcommittee has approved a spyware bill that would allow fines up to \$3 million for collecting personal information, diverting browsers and delivering some pop-up advertisements to computer users without their consent. The Securely Protect Yourself Against Cyber Trespass Act (SPY ACT), which bears little resemblance to the bill it replaced, also requires software that collects the personal information of computer users to notify the users of its installation, to get the users' consent before installation and to provide users with easy uninstall options. The House Subcommittee on Commerce, Trade and Consumer Protection last week approved SPY ACT. The bill requires that computer users be notified and be allowed to give consent before software that collects and transmits personal information is installed on their computers.

Group looks to ease InfiniBand use

■ Enterprise customers interested in high-speed, low-latency I/O switching fabric InfiniBand, but concerned about being locked into a vendor because of proprietary drivers needed to deploy the technology, should keep an eye on a new group working on making InfiniBand easier to use. The OpenIB Alliance launched last week with Dell, IBM, Sun and Intel heading a group of 13 systems, storage and InfiniBand vendors and high-performance computing users that are joining forces to create an open source software stack for deploying InfiniBand in Linux environments. The group says it will release its "software delivery schedule" in the third quarter and plans to make an open source stack available within a year. That means all Linux-based InfiniBand deployments ultimately will use the same software drivers embedded in the Linux operating system, streamlining the task of setting up InfiniBand clusters, members of the alliance say.

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Business services mgmt. on tap from HP

Company joins management vendors that promise to correlate IT with business success — or failure.

■ BY DENISE DUBIE

HP last week joined a growing number of management vendors looking to bring business-related performance metrics to their software and determine how well IT infrastructure and applications support processes and services.

While a number of vendors are pushing such plans, HP users appear generally skeptical about the company's initiative.

HP unveiled its OpenView Business Process Insight software last week at its annual HP Software Forum user conference. The show drew more than 1,700 attendees, many of whom heard for the first time the company's plans to correlate business metrics, such as orders processed and customer calls answered, with the performance of IT components such as routers or servers. In theory, the software would show how a down server affects the people,

services and revenue associated with a specific business process.

The concept of business services management or service-level management (depending on the vendor buzzword) is continuing to catch on, according to Forrester Research. The firm estimates the technology garnered about \$510 million in license revenue in 2003, which should increase to \$600 million in 2004 and is expected to jump again to \$750 million next year. Forrester identifies about 100 vendors trying to address IT managers' need to tune their networks to deliver service levels based on business-centric performance goals.

HP will compete with BMC, IBM, Managed Objects and Smarts, all of which have detailed product plans that promise to get business systems talking with management software and ultimately offer intelligent analysis on how the two could work better together.

By HP's definition, a business

Bridging the gap

A sampling of management vendors looking to integrate business and IT performance data.

Company:	HP	BMC	Managed Objects	SMARTS
Product:	OpenView Business Process Insight	Service Impact Manager	Business Service Level Management	InCharge Express Business Insight bundle
Description:	Designed to report on how IT performance supports — or hinders — the completion of pre-defined business processes.	Provides business relevance to IT performance metrics based on preset service models.	Compares IT performance metrics against service-level agreements and transaction-based business systems data.	Models services and automates correlation among business systems and network, application and server performance.
Price:	\$190,000	\$87,000	\$200,000	\$100,000

process not only relies on predefined services, software applications and network infrastructure, but also on specific people controlling parts of the process. The software, once configured to a customer environment, could relate how a missed step along the way would affect a compa-

ny's bottom line.

While several HP users last week commended the company on the concept, few seemed to find it a realistic goal for their IT shops. Many IT departments continue to work independently. For example, application groups might use different monitoring tools than network teams and server administrators.

That's the case for Randy Ellefsen, enterprise management architect at Gambro Healthcare in Lakewood, Colo. He says business managers at his organization would like that type of product today, but he's now facing the challenge of incorporating the goals of multiple IT divisions into one management plan — never mind applying business metrics.

"We are used to looking at servers, network gear, and are just now working at monitoring applications," he says. "It would be a big challenge to move up to the business-process level with the software."

Part of the problem, he says, is the various departments within IT still don't communicate enough to enable a software product to monitor for the proper metrics for applications.

"I do see the silos between IT departments coming down, but not entirely. For example, [OpenView Internet Services] points out glaring flaws in applications, and that is just getting us in the door with the applications group," Ellefsen says.

Another challenge is where to begin, says Pete Krueger, systems engineer at Best Buy in Eden Prairie, Minn. He says HP's

plans to bring multiple data points together would overwhelm his group. The retailer employs 650 IT specialists and maintains about 1,300 Windows and 300 Unix servers in its data center. The headquarters supports 650 locations, from which customers can use in-store applications to configure a home PC or check on product availability, for example.

"If HP could write out what has to be done to get two-second response time from an application or Best Buy will lose X amount of dollars, then it would be worth a look. But how do you measure that?" Krueger says.

Krueger says his team and business-unit managers met to determine infrastructure and application-monitoring the company performs now. Adding business processes could be time-consuming and potentially cost-prohibitive with HP's product priced starting at about \$190,000.

One HP user sees the value in aligning IT projects with business processes. Not yet a user of the new product, Andre Spatz, CIO of UNICEF, sees the benefits of correlating business and IT, regardless of the hurdles.

Using multiple HP products such as Service Desk and working closely with the vendor, Spatz says UNICEF's global IT infrastructure now can let employees set up schools and deliver aid to more than 245 locations in 158 countries.

"This is not something that gets done in one quarter or even in one year. It's very painful to achieve the gains," he says. ■

Cloudmark immunizes companies against spam

■ BY CARA GARRETSON

Cloudmark last week announced software designed to detect spam by using a "genetic map" that customizes itself to a company's definition of unwanted e-mail.

CEO Karl Jacob boasts that the company's Immunity software, which sits at a company's e-mail gateway, will catch 100% of enterprise customers' spam without generating any false positives. Immunity creates a genetic map, or storage structure, that contains all the known information describing spam messages and sifts through incoming e-mail looking for matches.

What sets Immunity apart from competing anti-spam software, such as products from Brightmail and Proofpoint, is its ability to automatically modify that genetic map to keep up with a company's changing definition of spam, Jacob says. "The key to stopping spam is having a complete understanding and knowledge of what's out there," he says. "The fundamental tenets [of other anti-spam products] is to collect what they know about spam and distill it down into a rule or list, then transfer that to an enterprise. What you get at the enterprise is never a complete picture of spam."

Immunity automatically updates the genetic map by monitoring end-user actions. For example, if one user in a company wants to receive messages with credit card offers while the rest of the organization does not, Immunity will capture that information

when the user chooses to receive such e-mail and modify the genetic map for that particular user, Jacob says. Cloudmark also gives Immunity customers monthly map updates via e-mail containing new information about spam, he adds.

"Immunity is . . . going in the direction of what I would call artificial intelligence systems that basically learn and adjust pretty dynamically" to what an enterprise defines as spam, says Sara Radicati, principal analyst at The Radicati Group. However, she notes she doesn't think any anti-spam product will eliminate unwanted messages completely.

By automatically updating itself, Immunity doesn't come with the administrative burden that other anti-spam software places on IT managers and end users, Jacob says. Users don't need to maintain and update whitelists and blacklists, for example. Cloudmark's new software also includes an administrative tool called nD Visualizer.

Cloudmark plans to release Immunity at \$15 per user, per year, and says it will make the software available by the end of July. The company will continue to sell its Authority enterprise anti-spam software, Jacob says, although he expects new enterprise network customers will choose Immunity instead for its high level of accuracy in catching spam and its ease of administration.

In addition to its enterprise software, Cloudmark sells anti-spam software for e-mail clients that lets end users report unwanted messages to the company's SpamNet spam-fighting community. ■



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AT&T president shares outlook

■ BY DENISE PAPPALARDO

AT&T is still the big dog in the telecom world, but it is one tough business, says President William Hannigan.

Hannigan spoke with a small group of IDG editors and analysts last week, sharing his view on everything from competition to technology directions. He joined the company as president in December after four years as CEO of Sabre Holdings. But telecom is not new to him. Hannigan spent 13 years at Sprint and then went on to hold many titles at SBC, including president of global markets.

While he says the telecom industry will recover, Hannigan says it will be different. "It's a very difficult business right now. I've been saying we're a great company in a lousy industry," he says. "There are way too many folks in the game pricing below costs."

But change is coming. "Industry consolidation is coming, even before the year is out," Hannigan says. "Will the consolidation be horizontal or vertical? I don't know. But there are too many players."

Although he wouldn't predict how many interexchange carriers (IXC) or local providers would be left standing, he did question MCI's health, referencing the company's deteriorating financials while it



Industry consolidation is coming, even before the year is out.

William Hannigan
President, AT&T

was in bankruptcy, and he questioned how much MCI and Sprint are spending on their networks.

AT&T's capital expenditures are a fraction of what they once were, but Hannigan says the company will plow about \$2.5 billion into the network this year.

Some of that money will be poured into programs that have helped see the company through these tough times, such as efforts to automate processes, standardize platforms and simplify the business.

Four years ago the company had 120,000 employees (including AT&T Wireless) and today it has 55,000. "Employee reduction is no fun, but it talks to how we can automate and improve the customer experience" at the same time, Hannigan says.

Besides striving to reduce the complexity of the network, the company has streamlined service offerings to make the company more efficient. He says AT&T now generates 90% of its revenue with less than 10% of its products.

It's all paying off. Even as AT&T's business service revenue has fallen, "over the last three years, business services has generated \$4 billion in cash year over year," Hannigan says.

Big business continues to be AT&T's strong suit. Of AT&T's \$34 billion in revenue, \$24 billion comes from business services, Hannigan says, "more than any other IXC or RBOC."

But everyone is knocking on the door, and the RBOCs represent a fiery new breed of competition. "Qwest and Verizon are getting quite aggressive on pricing," Hannigan says.

While some of the RBOCs have won deals based on pricing, he says the big companies lack AT&T's experience as a global network provider.

"The RBOCs can't spell global," Hannigan says. "That's not a cheap shot. Some have made good investments offshore, but not as far as operating a business offshore where users depend on a single point of contact. AT&T has 5,000 people offshore taking care of customers."

See Hannigan, page 18

Supercomm to reflect telecom industry revival

First Chicago show will feature flurry of product announcements.

■ BY JIM DUFFY, TIM GREENE AND JASON MESERVE

Last year, things started looking better ... this year, they are better.

Supercomm, the telecom industry's biggest party, kicks off this week at its new Chicago digs with upbeat news: Paid attendance, exhibitor count and square footage of exhibition space are all up from last year, show officials report. This is an indication that a market recovery is in full swing. The show also is expected to include significant announcements from key vendors — Lucent, Movaz Networks, Mahi Networks and Mangrove Systems among them.

Organizers expect 30,000 attendees — 20% more than last year, Supercomm's swan song in Atlanta after six years. There will be 100 more exhibitors at this year's show, 600 total; and 300,000 square feet of exhibition space, 22,000 more than 2003.

That's because carriers are picking up and spending again on equipment to offer new services to companies while decreasing their own operating expenses.

North American telecom service providers' overall capital spending experienced a year-over-year increase in the first quarter of 2004, the first in nearly three years, according to research firm RHK. Worldwide, service provider capital expenditures will remain roughly stable through the next five years, the firm found.

"This is a positive development for the industry, which has seen significant declines in spending in recent years," RHK said. Global capital spending declined 11% in 2003, to \$214 billion, after a nearly 30% decline the year before.

North American capital expenditures also are stabilizing, according to Infonetics Research. Carriers will spend \$47.4 billion this year, which is down 2% from 2003. RHK says North American capital spending rose 12% in the first quarter of 2004 compared with the first quarter of 2003.

The hottest area of investment is in equipment for wireless infrastructure and services, both firms found. In North America, capital spending for wireless rose 33% in the first quarter as wireless subscriber numbers increased rapidly. Wireline spending declined slightly in the first quarter.

That's not to say wireline is in a slump. Many wireline RFPs are on the street — such as AT&T's multi-service edge, SBC's optical add/drop multiplexer and switch, and Verizon's ATM/multiservice core projects.

With that, many vendors plan to unveil and demonstrate new gear designed to appeal to these specific and more general requirements of carriers that want to roll out next-generation telecom services to corporations.

Lucent is expected to announce a metropolitan optical system, the Metropolis Wavelength Services

Manager (WSM), designed to help service providers deliver optical bandwidth to their customers' premises for metropolitan-access, interoffice and regional applications. TCom, the fixed-network division of Deutsche Telekom, will start testing the dense wavelength division multiplexing (DWDM) system this summer, sources say.

Lucent confirmed it will be making a DWDM announcement at Supercomm but provided no details. Lucent and Movaz jointly developed WSM.

Movaz will unveil a reconfigurable optical add/drop multiplexer (ROADM) designed to "remotely and instantly" provision services through click-through adding and dropping of circuits. The so-called RAYROADM will help carriers by elimi-

nating manual provisioning and reducing the number of devices they have to manage and maintain, Movaz says.

Mahi Networks plans to unveil another ROADM, which it acquired from the bankrupt Photuris. Mahi's Vx7 ROADM, combined with its Mi7 metropolitan core aggregation system, will help carriers and cable companies provision new data and wavelength services to businesses, the company says.

Start-up Mangrove will unveil its line of metropolitan Multi-protocol Label Switching (MPLS) gear designed to make more efficient use of carrier metropolitan fiber rings.

Mangrove's Piranha 100 and 600 access boxes convert legacy ser-

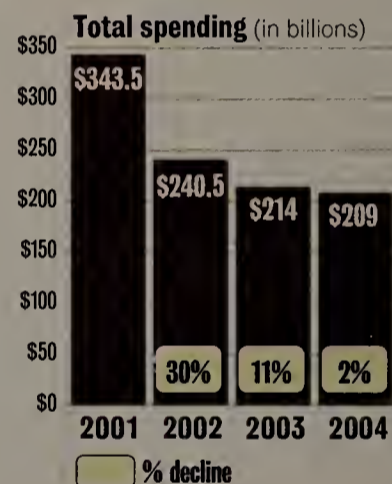
vices, such as frame relay, ATM and TDM, to MPLS packets at customer sites. This enables more efficient packing of traffic onto SONET networks, the company says. The company will demonstrate these two products and a prototype of its grooming box, called Barracuda.

Equipment to provision video services also will be prevalent. Radvision and Kasenna will announce products running on Intel's implementation of the Advanced Telecommunications Computing Architecture (AdvancedTCA), a new specification from the PCI Manufacturers Group targeting carrier-grade equipment.

Both Radvision and Kasenna have ported their media server and video delivery software to Intel blades that run in an AdvancedTCA-compliant chassis. A carrier running an AdvancedTCA chassis could have blades dedicated to on-demand streaming video delivery and others dedicated to telephony and conferencing applications in the same chassis. ■

Slowing declines

The drop-off in global carrier spending is leveling off.



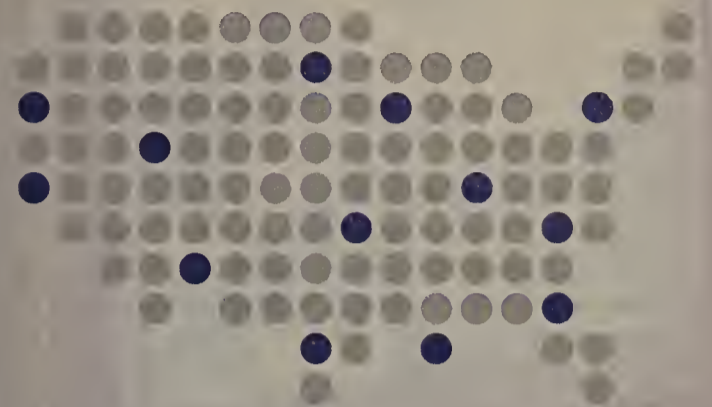
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Compliance, phishing top user concerns

Chief security officers aim to protect and serve corporate resources.

■ BY ELLEN MESSMER

SAN FRANCISCO — Finding cost-effective ways to comply with new regulatory requirements and safeguarding data in e-commerce are among today's most vexing issues for security managers, according to those attending two confabs last week.

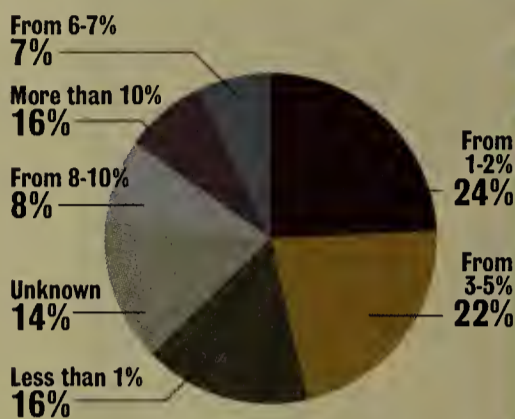
Helping their companies comply with federal laws such as Sarbanes-Oxley and California's data privacy law is becoming a big focus, said security managers at the annual NetSec Conference. Electric utilities say they face a panoply of new requirements to protect supervisory control and data acquisition (SCADA) networks used to monitor and control gas and power relays. Some attendees said the new industry rules, called the North America Electric Reliability Council (NERC) Cyber Security Standard 1200, are going to be expensive and difficult to implement because SCADA systems, while now IP-based, weren't designed with top-rate security in mind.

"Anti-virus software doesn't work on these SCADA systems," said Robert Childs, information security analyst at the Public Service Company of New Mexico, who spoke at NetSec about the challenges in working with SCADA vendors to get them to comply with the new rules. "Many of these systems are based on old Intel 8088 processors, and security options are limited to us."

NERC Cyber Security Standard 1200, which takes effect next January, will require electric utilities to define and

Paying for protection

What percentage of your IT budget is spent on security?



Based on responses from 481 security practitioners. (Figures do not total 100% due to rounding.)

SOURCES: CSI/FBI COMPUTER CRIME AND SECURITY SURVEY

Keeping it in-house

More than
60%
of 478 security practitioners
said they don't outsource any
security functions, according
to the latest CSI/FBI Computer
Crime and Security Survey.

fic patterns found on SCADA networks.

Outsourcing call centers, data centers and software development abroad is another area security man-

agers said they are increasingly paying attention to. They warned of regulatory concerns and security pitfalls.

Philip Alexander, security services manager at Wells Fargo Bank in San Francisco, said the bank has outsourced to India and has learned that regulations such as Sarbanes-Oxley and the California data privacy law still apply to data handled abroad.

"Just because the data is outside your network with a third party in another country, you still own it," Alexander said during a presentation at NetSec. "And your network is only as secure as their network."

This means at a minimum having foreign workers sign the same kind of appropriate data-use documents as signed by American workers, specifying what constitutes data misuse. But he acknowledged that it's much harder to monitor what happens abroad. Foreign legal structures also see things differently — for instance, it's virtually impossible to do a background check on a worker in India. "Birth dates are frequently not recorded," he noted.

See Security, page 102

Microsoft reiterates commitment to ERP software

■ BY JOHN FONTANA

Microsoft last week laid out the road map for its business applications and the concepts that are driving product development as the company tries to find footing as an ERP vendor.

As part of its announcement, Microsoft sought to counter sluggish revenue performance, organizational changes and layoffs in its Business Solutions Group (BSG), reiterating its commitment to research and development investments in four ERP products: Great Plains, Navision, Solomon and Axapta.

Microsoft says there will be new versions of all the products within the next nine months, starting with Great Plains 8.0 later this month. That will be followed by Solomon 6.0 in July, Navision 4.0 later this year and Axapta 4.0 early next year. Microsoft also announced a nebulous set of design concepts, such as Best Total Cost of Ownership and Connected Business, which would be used across the four products. The company promised more details in the coming weeks.

Revenue growth for BSG has been hard to come by, hitting only 4% in the company's third fiscal quarter.

"The fact that they didn't hit their numbers raised some real concerns about what is going on," says Chris Alliegro, an analyst for research firm Directions on Microsoft.

Just last year, CEO Steve Ballmer said he would grow BSG, which has yet to turn a profit, into a \$10 billion revenue producer by 2011. He predicted revenue growth between 24% and 32% for fiscal 2004, which ends June 30.

To hit the low end, Microsoft will need revenue of \$234 million in the fiscal 2004 fourth quarter, nearly \$44 million more than BSG has produced in a quarter.

"I don't think they have a chance to hit \$10 billion by 2011," Alliegro says.

Microsoft lately has been quiet about Project Green, a new ERP platform based on .Net that eventually will replace the current ERP products, which will be supported through 2012.

The company outsourced development of Solomon recently

document "critical cyber assets" on their SCADA networks, monitor access and protect information, and document recovery plans, testing, training and systems management. "You have to assign a member of senior management to be accountable," Childs said.

Compliance by his employer will entail adding substantial numbers of firewalls and intrusion-detection systems — and Childs said it's unclear whether commercial IDS products will work on the network, given the different traf-

Setting sail

Starting this month, Microsoft will begin shipping new versions of its four ERP applications.

ERP applications	What's new	Availability
Great Plains 8.0, professional services, manufacturing, wholesale, retail for mid-size businesses.	More than 100 feature enhancements; focused on access, control of financial data, improving common business processes.	End of June
Solomon 6.0, focused on project-based work.	New project management controls, features for government contractors and construction firms.	July
Navision 4.0, accounting and business management.	Interface, performance, setup, installation improvements.	Before the end of 2004
Axapta 4.0, lineup's high-end offering.	Improvement in manufacturing, and project and service management.	Early 2005

SOURCE: DIRECTIONS ON MICROSOFT, MICROSOFT

and laid off about 110 people. It also reorganized the structure of BSG with Senior Vice President Doug Burgum now reporting directly to Ballmer, and moved its Small and Midmarket Solutions and Partner Group from the Information Worker division to BSG to better align its applications and partner plans. Microsoft also announced that it had held merger talks with SAP late last year after steadfastly denying it had interest

in the ERP market beyond small and midsize businesses (SMB).

Despite all the turmoil, Microsoft's partners say the real problem is that SMB customers are not buying new ERP systems.

"Microsoft has a good product if the market was there, but it's not there. People aren't buying," says Jeff Markle, president of Markle and Co., a Great Plains reseller.

Analysts say Microsoft is still a power player in the crowded SMB

market, which now includes IBM, SAP and PeopleSoft.

"Microsoft still has great ambition," says Dwight Davis, an analyst with Summit Strategies. "The challenge internally is to integrate products and consolidate components. But I see similarities with their MSN efforts, which also had great expectations but didn't hit its target. Microsoft stuck with it and we're likely to see the same thing with the [BSG]." ■

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Cisco

continued from page 1

or switch port. Cisco partnered with Trend Micro, Symantec and Network Associates to make client-side anti-virus software work with Cisco's Trust Agent software, a PC-based agent that communicates client security status to Cisco network equipment and security servers. In November 2003, Cisco aimed to deliver router support for NAC by the middle of this year, but future support on other equipment was uncertain. Now Cisco says its entire Catalyst switch line and VPN 3000 series products will be NAC-capable by the first quarter of next year.

NAC is being tested at United Parcel Services (UPS) as a potential security measure.

"[NAC] could be another level of defense, but it can't be the only defense," says Ed Gotthelf, director of network architecture for UPS in Atlanta. Gotthelf says NAC "is a step in the right direction," but he says he would like to see a more industry-wide approach to LAN/WAN security.

"What the industry should do is rally around one solution that's fully interoperable," he says. UPS has an installed base of Cisco routers and switches, along with equipment from other vendors.

"One solution [is needed] that works with all software platforms and all networking platforms, so it can run on your Nortel and Cisco and other products," he says.

Cisco is working on this, according to Russell Rice, product marketing manager at the company.

"When we first announced [NAC], we said upfront that a goal was to provide an open framework on how network security gets done," Rice says.

Part of Cisco's Phase II plan for NAC will include proposing NAC's authentication technology as a standard to the IETF this August. Additional plans include opening the Trust Agent API to any vendor interested in writing software that works with NAC, on the client or server side. This would let vendors in the client software, server software and network equipment areas create products that work in a NAC infrastructure.

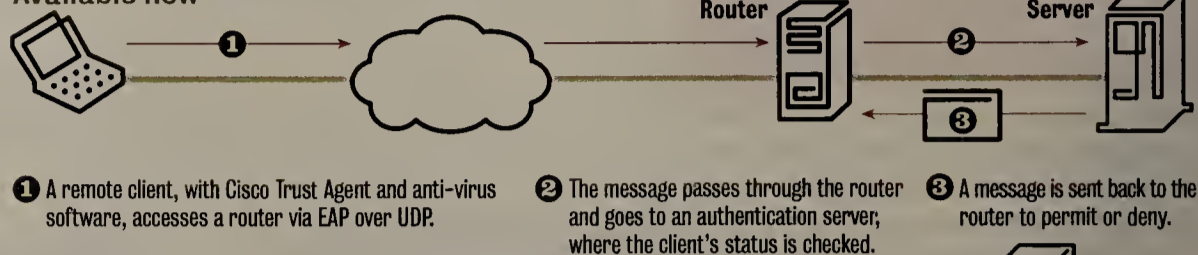
Cisco would not give a definitive time frame as to when switches and routers from competing vendors could plug into NAC via standards-based technology.

Another NAC feature, due next year, is a client audit technology for digging into non-PC machines — such as printers, IP phones, cameras and network appliances — trying to access a network (see graphic). Also, NAC now works only on Windows 2000, NT and

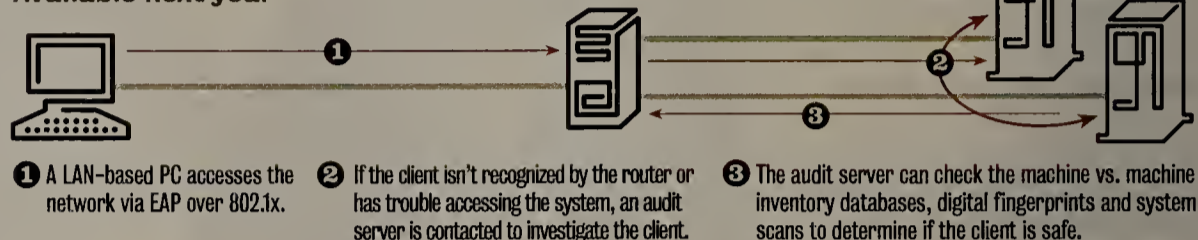
Securing the soft underbelly of corporate networks

Cisco's Network Admission Control technology makes all Cisco gear a security control point. Parts of NAC are available now, others are forthcoming.

Available now



Available next year



XP clients. Support is planned for Linux and Solaris machines by the fourth quarter of this year, Cisco says. The company is working with a few network auditing vendors for this part of NAC.

Missing from Phase II of NAC is a plan for wireless. Cisco's Rice says Layer 2 NAC support for Cisco Aironet gear will be introduced in a later phase sometime next year. In the meantime, users can implement Layer 3 NAC configurations by putting NAC-enabled Cisco routers behind Aironet access

points to enforce anti-virus and security policies.

NAC works by having Trust Agents — available for free from Cisco — check the status of virus software on client machines when a PC or laptop attempts to access a Cisco-based network. The NAC authentication process begins with a message based on Extensible Authentication Protocol (EAP), running over User Datagram Protocol (UDP). Access control lists (ACL) on routers are set to block all traffic except EAP over UDP. The routers then send

the connection attempt to a back-end Cisco Access Control Server, which verifies end-user credentials and forwards network policies, to be applied to the client via the router.

Depending on the configuration, clients can be permitted access, blocked or quarantined, in which case they would have limited network access. (This EAP/UDP-based scheme will be proposed as an RFC to the IETF) Cisco plans to move this authentication scheme to EAP over 802.1X when it adds NAC support for Layer 2 switches next year.

Some observers say Cisco's NAC blueprint will be a good additional security layer in a Cisco-based infrastructure. But the capabilities offered now are not unique, and the timeframe for release might be too drawn out for some customers who face new security threats on a weekly or daily basis.

"Some enterprises are suffering badly right now from infections of mobile laptops," says Mark Bouchard, an analyst with Meta Group.

He says individual and joint product offerings from vendors such as Network Associates, Check Point, Nortel and Sygate already deliver what Cisco is making available this week.

Also, the road map for including LAN switch support in NAC, "is not a lot different than what Enterasys talks about right now," says Zeus Kerravala, an analyst with The Yankee Group.

"What Cisco has going for it is the lion's share of the enterprise switch market," Kerravala says. ■

Vendors combine configuration wares

■ BY JOHN FONTANA

Configuration management vendors AlterPoint and Configuresoft plan to integrate their products to provide corporations with a unified platform for letting users change and monitor configuration data on everything from network devices to applications.

The two vendors concentrate on the same configuration management fundamentals of change control and disaster recovery. But AlterPoint focuses on any IP-addressable device on the network such as switches, routers and firewalls, while Configuresoft watches Windows-based servers and desktops.

The two say that providing a full range of configuration data will let companies understand the dependencies among all network nodes and maintain consistent configurations that will provide for a more secure and reliable network. The vendors' software lets users assess, manage and audit configurations on network devices, servers and applications.

"This helps us to analyze our infrastructure

better and drives services," says Bob McSwigan, manager of enterprise technology in the network services department of Siemens Business Services. He cites SAP as an example. "We can optimally configure servers, firewalls and routers so everything looks a certain way and helps us support our [service-level agreements]," he says. "The endgame is to help us manage our applications more efficiently."

In the next three months, the vendors plan to integrate certain pieces of configuration data collected by each system. For example, a server manager using Configuresoft's Enterprise Configuration Manager (ECM) could see some data from AlterPoint's DeviceAuthority Suite and know that a firewall used to protect an application is configured properly. By year-end, the vendors will let administrators change configuration data within each system from the administrative console of either platform.

The two vendors say such a holistic view of configuration data can highlight vulnerable points in the network for services such as

e-mail, and let administrators be more proactive in building reliability into a network.

AlterPoint's DeviceAuthority Suite includes a server, a set of adapters and an Open Database Connectivity-compliant database. It has two application components, the Audit Module for inventory reporting and the Update Module, which automates mass configuration changes across any range of devices. The suite supports more than 1,000 network devices from 25 manufacturers and audits in real time any change made to any of those devices.

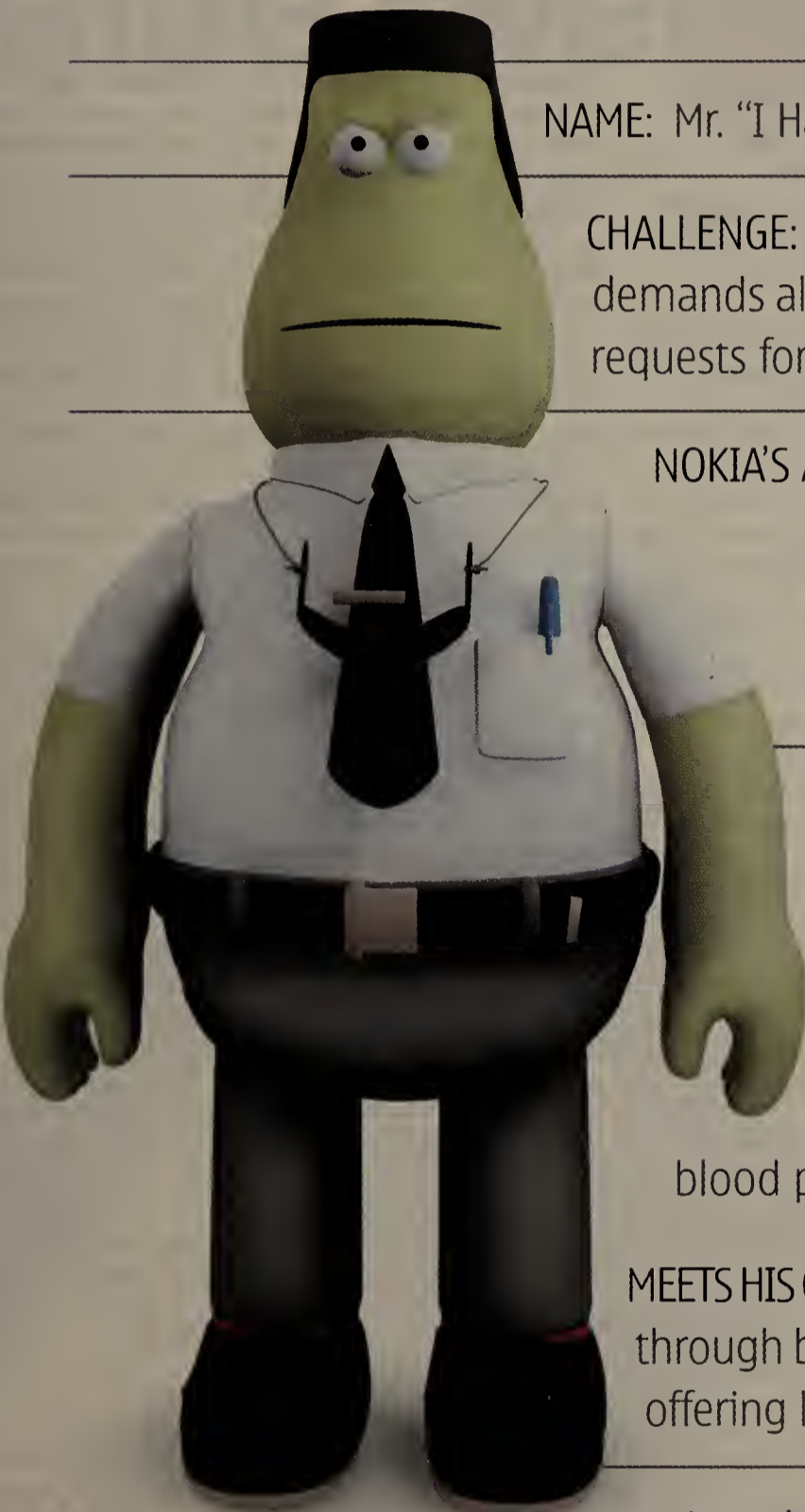
AlterPoint competes with vendors such as Intelliden, Rendition Networks and Voyence.

"Adaptive computing, on-demand computing, that is the long-range view of where we are going with this," says Jeff Ait, president and CEO of AlterPoint.

Configuresoft's ECM is a database-driven configuration management system that works with Windows-based servers and desktops. The company in April added support for mobile laptops. ECM also supports automatic rollbacks, so if a configuration setting is changed it automatically is returned to the prescribed setting. The software also offers templates to manage regulatory compliance. ECM competes with software from Ecora, Microsoft and others. ■

By 2006, 75% of all system and application changes, excluding user administration, will be driven by security demands, according to Gartner.

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Upheaval

continued from page 1

Broadband wireless has the potential to address the convergence of those two desires and let people work from anywhere and accomplish anything. It makes it apparent that the existing land-line networks may be largely irrelevant."

This disrupts the incumbent carriers' business models. Carriers depend on wireline access as the foundation of their service revenue, which is still primarily driven by voice.

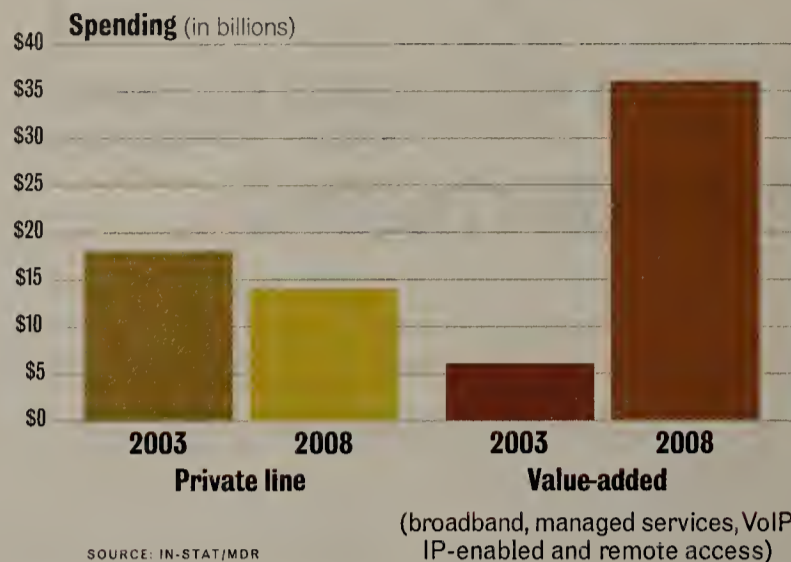
But increasingly, people are substituting their primary phone lines with wireless. In the U.S., wireless access is expected to eclipse wireline in three to five years, the Cellular Telecommunications and Internet Association estimates.

Carriers are beginning to see the transition. Verizon saw first-quarter wireless revenue increase 21% over the same period a year ago, while wireline revenue decreased more than 3%.

Voice revenue also has been in decline for years. But VoIP further devalues voice by making it just another application on a data

Diverging data trends

Companies are predicted to spend dramatically more on value-added data services vs. traditional private line data services over the next few years.



network that offers several other ways to interact, such as e-mail, instant messaging and image transfers.

Moreover, VoIP services such as Skype and Free World Dialup make Internet voice calls as inexpensive as sending e-mail — in other words, free. Your voice carrier of tomorrow could be an ISP

"It's more important to be an ISP now," says John Barrett, an analyst with Parks Associates. "Broadband service is not the value-added service on top of phone service. It flops it around and becomes the core service that you build other things on top of."

Most major carriers are taking on more ISP-like characteristics,

spent dearly to acquire a stable of cable TV companies, thinking that was the future, but in the process its debt ballooned to an all-time high of \$65 billion. Selling off AT&T Wireless returned \$19.2 billion to shareholders.

"Looking back on the decision, which was made before my time [at AT&T], we would not have done that if we didn't have to," he says. "We would prefer to own that wireless business, yes."

To fill the gap, in May AT&T signed a five-year, non-exclusive deal to resell Sprint wireless services (www.nwfusion.com, DocFinder: 2556).

AT&T expects to offer wireless services by year-end as a so-called mobile virtual network operator. Under the deal, AT&T will provide customer service, billing and landline network support. All wireless long-distance voice calls will be handed off to AT&T's landline network with the exception of any call destined for the Sprint PCS network.

"Our plan was to, Day One, change the way companies buy wireless. And Day Two, leverage the heck out of data," Hannigan says. AT&T is talking with Sprint about how it can bolt equipment onto the Sprint network to add data-networking capabilities that will only be available to AT&T customers, he says.

In addition to cellular wireless, AT&T also has a network of 2,200 Wi-Fi hot spots that customers use to access the Internet or corporate networks. And the company is looking into new technologies such as WiMAX.

"We can't put a bet on one type of access technology," Hannigan says. ■

“There are way too many folks in the game pricing below costs.”

William Hannigan
President, AT&T

Hannigan

continued from page 12

Those employees include account managers, program managers, customer service representatives and network engineers.

Besides competing with the RBOCs, Hannigan likes to point out that he is their largest customer. AT&T spends \$8.5 billion annually on local access. That figure likely will rise this year after the U.S. Office of the Solicitor General earlier this month decided not to appeal a court ruling overturning much of the FCC's rules governing network sharing.

"We were definitely disappointed in the administration's decision," Hannigan says. He wryly adds that clearly the money the incumbent local exchange carriers spent in lobbying efforts "made a difference in terms of the administration's interpretation of the [1996] Telecom Act."

If the RBOCs raise their access rates, AT&T says it will affect consumer pricing, might force it to pull out of certain markets and could force it to raise small-business rates.

But Hannigan says the ruling does provide some clarity in how AT&T will go to market from a technology perspective. It's all about VoIP and wireless, he says. "We're pivoting the whole company on all things wireless and all things VoIP."

Wireless wannabes

When asked why AT&T sold AT&T Wireless in 2001 when that is the future, Hannigan says, "we had to because of balance sheet necessity." AT&T had

starting with services such as VoIP. Verizon plans to offer business and residential VoIP this year; SBC unveiled its PremierServ Hosted IP Communication Service last fall; BellSouth is conducting softswitch-based hosted service trials and turned up a Centrex IP service in May; Qwest offers residential VoIP in Minnesota; and MCI recently unveiled a VoIP-over-DSL service for small businesses as an extension to the local VoIP services it's offered for two years.

Some telcos also see a separation coming between access to the service network and the service itself. Currently, an entry-level carrier service includes access and voice. But VoIP services such as Skype and Free World Dialup and Vonage are just that — services. They do not provide network access; that comes from someone else.

"We're moving to a world where you have two types of things out there: broadband access platforms — and that's going to be the local loop of the 21st century — and applications, which are going to rely on IP," says Rick Whitt, senior director of global policy and planning at MCI. "VoIP is just the first of the coming wave of IP-based or enabled applications that will be using broadband platforms."

"There are going to be access carriers and service carriers," says Thomas Nolle, president of consultancy CIMI.

For businesses such as Ryla, it could mean they buy fewer lines from their traditional incumbent local exchange and interexchange carriers. But those lines will be higher-capacity, and the telco — or whomever provides those pipes — will make money on the amount of capacity and level of service a business requires vs. number of lines.

Some carriers, however, don't see it that way, especially when they can bundle services and offer them at flat discounted rates.

"The ability to get price certainty, local service, long-distance service — vertical services such as caller ID and call waiting — all from one provider is what's attractive to customers, as opposed to getting the pipe from one company and specific services from another," says Steve Davis, senior vice president of public policy for Qwest.

Interestingly, Qwest is showing signs of preparing to provide access-only services. In February, the company unveiled a stand-alone DSL service whereby it will offer the broadband pipe to cus-

tomers without requiring them to also subscribe to local or long-distance voice service (www.nwfusion.com, DocFinder: 2543).

Other RBOCs, such as BellSouth, are resisting demands that they divorce voice from DSL for fear of losing primary line and enhanced service revenue, analysts suggest, and becoming nothing more than broadband access providers (DocFinder: 2544). This is why carriers such as SBC see VoIP and broadband wireless as such a threat (DocFinder: 2545).

Threat or opportunity?

MCI made that mistake two years ago, and it might have cost the carrier a customer.

"There was a real hesitancy to even talk about IP telephony," says Chris McDaniel, CIO at Mutual Service, a West Palm Beach, Fla., brokerage. "They wanted us to stay with their traditional [plain old telephone service] lines and voice connections."

Mutual Service switched to AT&T VoIP and cut its per-minute voice charges nearly in half. "It makes me wonder how they can do that without killing their bottom line," McDaniel says.

Perhaps AT&T and other carriers can make it up by tipping the scales more toward services and away from access.

Ryla is expecting that transition. Already, AT&T provides 24-7 management and monitoring for Ryla's VoIP service. The carrier is even getting some of its customer's contact center business by handling calls on behalf of Ryla when Ryla agents are unavailable.

"You can do [interactive voice response], you can do [automated telephone dispatch] in the cloud," Dashevskiy says. "So AT&T is offering more and more services, which will eliminate headaches and expenses on the business side."

Expect other carriers to follow suit. ■



More online!

One of the nagging questions in telecom is what role, if any, federal and state regulators should play as VoIP, wireless and other broadband IP services become commonplace.

DocFinder: 2554

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Challenge

continued from page 1

In their formal responses printed here, Avaya and Cisco agreed with Mier's assertions in general, but were quick to defend measures they've already taken in these directions. What neither company offered, though, were detailed plans for improving the overall state of VoIP security.

Cisco's response

To successfully protect an organization, security must be fully integrated into all aspects of the network. This is the essence of the Cisco Self-Defending Network strategy for information security.

The unique Cisco security model proactively addresses the challenges associated with securing integrated data, voice and video through focus on three key aspects of information security: secure connectivity, threat defense, and trust and identity management. While voice and video have unique requirements, the results of this evaluation clearly showed that the Cisco integrated, multi-layer approach to security can make IP-based voice very secure.

It's important to note that most of the security tools Cisco used in the VoIP security test (DocFinder: 2547) already should be part of any organization's network security strategy, and there is no additional cost for any of the voice-specific tools.

Cisco agrees that designing and implementing security must be simplified. We are committed to making improvements in this area, using both education and tools.

Education and assistance include:

The charge:

Setting layered, VoIP security parameters is extremely difficult.

The prime offenders:

Cisco, Avaya, VoIP vendors in general.

The challenges:

Part 1: Provide better educational information and services. Part 2: Build tools that set global security parameters.

The debate:

Join our online forum at www.nwfusion.com, DocFinder: 2231.

- Currently Cisco documents best practices and hardware and software configurations in its SAFE blueprints (see DocFinder: 2548).

- The Cisco Security Certification provides best-of-class training and exams. The Cisco Security Specialization Program recognizes the Cisco Channel partners who are best prepared to install and support secure network solutions.

- Cisco sponsors worldwide "Networkers" conferences for customers, with security tracks providing detailed training on security issues and best practices.

Simplified tools and interfaces

Cisco has many tools designed to simplify configuration and installation of its products to make critical security functionality more accessible. These tools are being continuously enhanced with voice-specific features. Available Cisco tools include:

- Cisco AutoQoS features in both CatOS and IOS software automatically configure network QoS parameters for VoIP according to Cisco's best practices.

- Cisco AutoSecure is a new IOS Software feature that incorporates a "one touch" device lockdown process, enabling rapid implementation of critical security policies and procedures.

- Cisco Smartports is a feature for all Catalyst switches that simplifies the configuration of critical features for Ethernet. Smartports assists Cisco IP Telephony configuration via pre-tested switch port configurations or "macros" recommended by Cisco best practices.

- Cisco Security Agent provides "day zero" threat protection for server and desktop computing systems. It combines host intrusion prevention, distributed firewall, malicious mobile code protection, operating system integrity assurance and audit log consolidation all within a single agent package.

Conclusion

As our performance in *Network World's* recent VoIP security test showed, Cisco understands how to build secure networks for voice, video and data. While more work remains to be done, Cisco already has taken innovative steps to simplify the configuration process while at the same time adding more comprehensive security features.

Avaya's response

Avaya provides a holistic approach to securing converged communications based on a Trusted Communication Framework. This framework delivers applications, systems and services that protect multi-vendor converged networks.

Avaya's IP telephony systems are infrastructure-agnostic. On Layers 2 through 5, customers can employ a configuration identical to the one supplied by Cisco in the *Network World* test. As noted in the test results, we also support Real-Time Transfer Protocol encryption in Layer 6, which extends to the entire line of Avaya's IP phones, and our latest release of Communication Manager supports signaling encryption for our distributed media gateways.

As for the issues raised in the recent Tester's Challenge, we agree with Ed Mier that the industry must continue to prioritize VoIP security. Our response is segmented to address the three areas he touches on.

Assessment, management and monitoring

According to Avaya research, more than half of all companies want some form of security assistance. Avaya offers consulting services that help companies assess network readiness, security and business continuity. We team with leading security vendors to deliver managed security services, providing firewall management and anti-virus protection in any multi-vendor network. Avaya also offers 24-7 remote security monitoring, enabling assistance for security deployment, including risk assess-

ment/management.

Education

Avaya has an aggressive program to educate companies on securing converged communications. Avaya also offers security seminars, Webinars, white papers, security advisories and sponsors events such as the Gartner Security Summit and NetSec 2004 (see DocFinder: 2549).

We have security tools that are easy to use. It is Avaya's philosophy that brute-force solutions requiring an expensive army of security experts is not what customers need. Our security management architecture (Avaya VPN Manager) lets a small group cost-effectively define security policies by using tools that:

- Provide centralized security policy and configuration to firewall and VPN devices.

- Simplify setup with firewall templates and VPN wizards, including check-box activation of IP telephony firewall proxy and network address translation services.

Additionally, Avaya Installation Wizards guide users through IP installations. In the future, our Wizards will be extended with centralized provisioning tools.

Headed toward the future

Avaya believes that the future of converged communications will evolve toward a model supporting greater mobility and wireless communications. As a result:

- Avaya will implement a flexible, multi-layered authentication framework that supports emerging security standards that establish trust between users and devices for secure user communications from any location.

- Future security management should accommodate unified identity management solutions combining mobile user profiles and self-contained security. Avaya will look to standards when building its own solutions and partnerships.

- Future security implementations need to focus on industry-standard security certifications such as IEEE, IETF and the International Telecommunication Union, and groups such as the Network Integrity Consortium, in which Avaya participates. ■

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HP network group digs in its heels

New LAN/WLAN gear, recent 10G technology acquisition, hone HP's network focus.

■ BY PHIL HOCHMUTH

New LAN and WAN gear from HP and a recent acquisition of 10G Ethernet technology are new signals that the enterprise computing giant is serious about becoming the alternative to Cisco for corporate network executives.

HP last week refreshed its ProCurve line of LAN switches and wireless LAN (WLAN) switches

and access points. The company added high-density Gigabit Ethernet and Power over Ethernet (PoE) blades for its 5300 series switches, and security, virtual LAN and multi-cast software enhancements for its 9300 series backbone switch. Also released was new software for improving security on ProCurve Secure Access 700wl series WLAN switches and new indoor/outdoor antennas for the 420 and 520 WLAN access points.

These announcements came a week after HP announced the \$28 million purchase of

Ethernet technology from metropolitan Ethernet vendor Riverstone Networks (a former Cabletron company). HP bought the hardware designs and software technology of Riverstone's XGS 10G Ethernet product line, aimed at corporations. (Riverstone introduced the products last year, but stopped developing them to refocus on carrier customers.)

The XGS technology will be the base for new switches, due out by year-end, that will be used to link HP ProCurve 5300 and stackable switches at the edge with 10G Ethernet links. In this blueprint, HP switches at the edge would be the primary point of switching, routing intelligence, with large pipes hooking the edge boxes back to a 10G central switch. With this topology, network services such as VoIP, wireless and policy-based networking will be easier to deploy for users, says Brice Clark, worldwide director for strategy and business planning, ProCurve Networking at HP.

Observers say the continuing stream of new LAN and WLAN ProCurve products, and the addition of 10G Ethernet intellectual property, are signs that HP is serious about competing with market-leader Cisco in the campus switching, data center and WLAN markets.

HP grew its total LAN switch revenue and port shipment market share by 30% in 2003, according to Synergy Research Group, while top competitors such as 3Com, Cisco, Nortel, Extreme and Enterasys all saw their revenues shrink from the previous year. (Only Foundry and Dell grew more than HP, at 31% and 38% respectively).

In the overall Ethernet LAN market, HP was fourth in terms of port shipments last year, behind Cisco, 3Com and Netgear. The company is strongest in fixed-configuration Layer 2 switches, and the company held 7% of the market for those port shipments in 2004, behind Cisco with 55% and 3Com with 10.5%.

See HP, page 24

RLX reinforces blade server mgmt. software

■ BY JENNIFER MEARS

As blade servers move higher on the list of hardware options for enterprise data centers, vendors are working to better integrate the thin systems into existing infrastructures, by making them easier to manage.

Blade vendor RLX Technologies, one of the first to introduce blades to the market in 2001, has focused on the management technology it sells along with its blade servers. Last week, RLX unveiled the sixth generation of its Control Tower management software, which lets customers not only remotely manage blades but also to set rules and policies to automate how the systems are kept up and running.

"We're addressing issues such as failover, poor performance and the need for additional performance," says Doug Erwin, CEO of RLX. "This management capability enables companies to more easily scale out or dial up the demand as they need across various applications."

Analysts say Control Tower 6G brings management features that vendors such as HP and IBM don't yet have for their blade systems.

"RLX is really focusing on the difficulties

of managing blade servers, like provisioning and workload management and that kind of thing," says John Abbott, chief analyst at The 451 Group. "They're ahead of the big vendors in terms of sophistication and automation of the management tasks."

While the bigger vendors offer management tools designed for blade servers, most of the management comes from their server management packages, such as IBM Director and HP's Insight Manager. "The bigger vendors tend to be a little bit more general, while RLX focuses specifically on blades," Abbott says.

However, he points out that all the vendors are moving in a similar direction with the goal of automating the management of pools of blade servers, which are designed to be deployed in clusters or grids to handle enterprise workloads. HP two weeks ago announced that it was integrating VMware's virtual machine software into its BL20p blade servers to increase server utilization and ease management of blade deployments.

Control Tower 6G, which will be available next month, adds three new capabilities to the Control Tower platform, which enables users to remotely manage and provision

See RLX, page 24

Blade control

RLX Technologies is updating its blade management software. A look at some of what the competition has to offer:

HP

ProLiant Essentials Rapid Deployment Pack: integrates Altiris technology that lets users deploy and provision servers. **Systems Insight Manager:** monitors and manages heterogeneous servers.

IBM

IBM Director: monitors and manages heterogeneous servers.

Sun

N1 Grid Provisioning Server Blades: let users remotely provision blades to act as a single virtual pool of compute resources.

Dell

Open Manage Remote Deployment and Systems Management Software: deploys and manages servers remotely.

Short Takes

■ **Nokia** is upgrading software for its Secure Sockets Layer remote-access appliances so they can fail over to one another in the event of a problem and share configuration settings when system changes occur. With **Secure Access System 2.0** software, two of Nokia's IP Security appliances can be cabled together so if the primary one fails, the backup takes over.

The new software includes configuration replication, which lets groups of Nokia appliances share settings — if one box is updated, it shares its new configuration with the rest of the group. The 2.0 software supports simplified sign-in by remembering the logons for servers being accessed through the Nokia appliances.

On subsequent attempts to access the same server, the Nokia box issues the logon information on behalf of the end user. Secure Access System 2.0 will be available next week standard with new appliances and as an upgrade for current customers. The software is licensed based on the number of users ranging from \$11,000 for 50 users to \$55,000 for 500.

■ In an effort to attract more blade server customers, **IBM** is offering the BladeCenter chassis, which houses its blade systems for 50% off its retail price when purchased on IBM.com. The IBM Web price is just less than \$2,800. The 7U chassis can hold up to 14 of IBM's dual-processor HS20 blades, according to IBM. The blade chassis includes integrated networking modules and power supplies for all blades housed in the chassis. The offer is good through Sept. 20.

■ **Isilon** last week uncrated replication software for its IQ 1440 and 2250 clustered storage appliances. The SyncIQ replication software will let data be replicated between clusters of Isilon appliances over the LAN or WAN. SyncIQ is about \$5,000 per node. Two three-node clusters would cost about \$30,000.

TOLLY ON
TECHNOLOGYKevin
Tolly

The conventional wisdom is that Secure Sockets Layer VPNs are simple. It's a lie. They are enormously complex — vendors just make it look simple to the user. A recent project gave me a chance to dig deeply into this important area, and I was impressed by the sophistication of some implementations — and corresponding gaps in others.

Ostensibly, the hybrid SSL VPN came about to provide the “tunnel-across-the-Internet” features of traditional VPNs sans the need for the installation of client VPN software and the often nightmarishly difficult configuration thereof.

Paradoxically, though, the best SSL VPN offerings are strongly “anti-VPN.” This is because the seamless connection between far-flung computers into one logical net-

SSL VPNs: Complexity to make your life simpler

work, which VPN technology provides effectively, can turn your network into a sieve when the remote computer is either quasi-public, used by multiple people or in any way out of corporate control, which, by definition, it is.

The difficulty in installing and configuring stand-alone VPN software often prevented such computers from being involved, but today it is quite easy, for example, to create a VPN connection from any Windows XP machine to which you happen to have access. Within a few minutes, you can be browsing your intranet, accessing server shares — and perhaps inadvertently exposing corporate data to unauthorized distribution or misuse.

SSL VPNs are “clientless,” meaning that one need not install or prepare the client machine used for the session. All the required software is downloaded at session initiation as ActiveX control or a Java applet (depending on whether you are running a Microsoft browser or not). Thus, any machine in an airport kiosk or hotel lobby can instantly allow you to access cor-

porate resources — and if you've picked the wrong SSL VPN solution — just as quickly become a gold mine for people up to no good.

Where often we find situations in which comparing data sheets from different vendors results ultimately in identifying, as the old saying goes, “distinctions without a difference,” that is not the case with SSL VPNs. To the contrary, vendor data sheets tend to be a little too high-level, thus hiding, intentionally or inadvertently, important implementation differences that can mean the difference between a secure or a Swiss-cheese network.

I'd bet that every one of the dozens of SSL VPN vendors says it provides a secure environment for browsing intranet or Internet Web sites from the SSL VPN client. A spot check of, say, the browser history on the client might lead you to believe that the product you are considering is safe. But there's more to it than that.

What about any cookies picked up during the session? We found that several major players leave them behind. While

many products will delete any e-mail attachments that you've downloaded and read, some will fail to delete the files you downloaded from the Internet or your intranet.

If you clicked “yes” on the auto-complete password prompt, you'd better change your password immediately, as several major SSL VPN providers allow that information to remain on the machine after you log off your session. I could go on.

Just in the areas of endpoint security and access control policy, we've identified more than two dozen discrete tests that can be applied to evaluating features and functions of SSL VPNs. Go to www.nwfusion.com, DocFinder: 2527 for details.

Follow ours or develop your own — just don't deploy unless you've put your network under the microscope.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Boca Raton, Fla. He can be reached at ktolly@tolly.com.

HP

continued from page 21

While HP does not break out the profit from its ProCurve business group, LAN switch revenue numbers for HP from analysts show that the business unit accounted for less than 1% of HP's \$73 billion in sales last year.

Two factors that should help the ProCurve push further into enterprise networks are low prices (HP's Ethernet gear averages about \$90 less than Cisco) and HP's presence in enterprise data center computers.

“ProCurve is HP's best-kept secret,” says Joe Thielen, IT manager for Celestial Seasonings, a wholly owned subsidiary of Hain Celestial Group. During a recent upgrade of the company's Boulder, Colo., data center, Thielen says he had a blueprint in his mind of HP servers and Cisco on the data center network and storage-area network aspect. When HP brought up its data network gear, the vendor proposed a data center network at half the cost of the Cisco quote, and with more Layer 3 and Layer 4 switching capabilities than Cisco.

Thielen says the lifetime warranty on the ProCurve 5300 series switches made them less expensive to own and operate in the long run, as opposed to buying maintenance contracts required on Cisco gear.

Many users are interested in a LAN vendor's financial viability, says Stan Schatt, an analyst with Forrester Research. This makes HP an attractive choice given the financial troubles of companies such as 3Com, Nortel and Enterasys Networks over the last few years.

“HP is shaping up to be one of a few companies that big enterprises are comfortable with” in terms of vendor financial viability, Schatt says.

The road for ProCurve

HP's ProCurve network group has enhanced its wireless, security, 10G and power over Ethernet technologies over the last year as it tries to establish the company as the large-enterprise alternative to Cisco. Going forward, experts say HP ProCurve must:

- Continue pushing toward an end-to-end product, expanding or partnering in areas such as WAN routing, firewall/VPN and VoIP.
- Leverage HP's computing presence in data centers to promote switching and routing gear.
- Keep pace with other competitors — such as Dell and 3Com/Huawei — aiming at Cisco with end-to-end product menus and lower-cost hardware.

An important decision by HP last year was the company's move into the WLAN market with its line of Wi-Fi access points and WLAN switches with integrated security and ability to manage roaming clients.

The move from reselling equipment to producing its own high-end LAN gear will be a boon to HP in terms of customer perception, Schatt says. (HP's 10G equipment is resold from Foundry Networks.)

Going forward, he says HP should focus on integrating its LAN switch business more closely with its HP OpenView group and the enterprise computing side of the house to create a clearer end-to-end picture for customers. Partnerships with vendors in the areas of edge WAN routing and VoIP also will be important for HP if it wants to crack more large enterprise accounts with ProCurve gear. ■

RLX

continued from page 21

blade servers as one pool of resources. Late last year, RLX updated Control Tower to let it provide basic management capabilities for blade servers and 1U systems from other vendors.

New in Control Tower 6G are:

- Workload Inspector, which manages Layer 3-7 network infrastructure and monitors performance.
- Automation Policy Manager, which uses data that the Workload Inspector collects to let customers set conditions for automated actions such as dynamically allocating more server capacity in response to application needs.
- Automation Sparing Manager, which lets users designate blades within the chassis as spare blades to be deployed — with necessary configurations and storage access — should critical systems fail.

Control Tower 6G is aimed at letting users take pools of servers and manage them in a utility computing manner, where resources can be provisioned on the fly in response to application demands.

Dan Stivers, CEO of 7ticks IT Consulting, which provides technical services to the financial industry, settled on RLX blades last year after testing blade servers from HP and IBM. Stivers says RLX's Control Tower software has been key in helping reduce costs and make management of some 100 blades more efficient.

“Blade servers and the right management software are creating a quantum leap forward in the data center,” he says. “We've seen a massive reduction in system administration time and a massive increase in reliability [as a result of the Control Tower software].”

Stivers says administrative tasks that once

took five IT staff to handle now can be done with one person. “And that's a conservative estimate,” he says.

Control Tower 6G, which has been in production at 7ticks for about a month, lets Stivers add even greater efficiencies and service more customers without having to add IT support.

“We've gotten more clients, and I haven't had to make changes,” he says. “It's allowed me to ramp up more revenue with less strain on the guys. So we can take a breather and focus on other areas.”

Added support for storage-area networks and direct-attached storage, in addition to existing network-attached storage connectivity, is also a plus for Stivers, who runs diskless blades that all boot off a SAN.

Control Tower is shipped as a 1U appliance, which provides basic monitoring and alerting capabilities for servers that plug into the Control Tower management network via a network interface card. Modules can be loaded onto the appliance to add management and monitoring features. Pricing for Control Tower starts at about \$5,000, and modules are priced on a per-node basis. A provisioning module, for example, costs about \$150 per server. ■



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In *Network World's* Webcast, Johna Till Johnson, president of Nemertes Research, offers practical advice for structuring what's being called “The New Data Center”

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Special Focus

DATA CENTER: The role of appliances.

Data center appliances expand capabilities

■ BY PHIL HOCHMUTH

New traffic optimization and application acceleration devices combine the features of Layer 4-7 switching along with other technical hooks and tricks aimed at making corporate servers run faster.

New vendors and those that have re-invented themselves over the past few years are promoting appliances that add compression, caching, denial-of-service attack mitigation and other features designed to make data center servers run more smoothly and securely.

Some observers say these appliances also consolidate, and even outperform, features of products from traditional vendors such as Cisco, F5 Networks, Foundry Networks, Nortel and Radware.

NetScaler had been a large vendor among ISPs and carriers during the dot-com/telecom bubble, as its Layer 4-7 switches were used to front Web sites and server cages in large hosting centers. When its key markets collapsed, the company refocused on enterprise customers and re-engineered its products to provide more types of services appropriate for corporate data centers.

On the architecture front, NetScaler introduced its 9000 and 9300 series of appliances, which are based on Intel Xeon processors and resemble PCs more than ASCII-based application switches. The devices include a Layer 4-7 packet inspection engine, which can load balance and switch traffic to different servers based on high-level packet data.

“Handling all those sessions, that’s what was killing our servers.”

Nader Shaterian
CIO, Marsys

Many tricks up its sleeve

With a hard drive and fast Intel-based performance, NetScaler says its boxes can support features such as server caching including static and dynamic database content, and application compression. This helps Web-based applications run more efficiently by streamlining data flows between clients and data centers.

The box can act as a Secure Sockets Layer acceleration appliance, offloading encryption duties from a server and acting as an SSL VPN termination gateway.

Because its features run in software on the Intel processors, NetScaler says the device can do more than hardware-based Layer 4-7 switches.

Redline Networks is another new vendor in the data center box market. Like NetScaler, Redline sells a device that is based on Intel hardware that provides compression, multi-layer traffic routing, TCP offload and load balancing.

ChartOne, a chart management company in San Jose, started using Redline appliances more than a year ago when its PeopleSoft ERP servers were not performing well. The servers host about 150 clients on the electronic

More than a switch

New and established competitors in the Layer 4-7 appliance market are adding features beyond deep packet switching to optimize data center traffic. Such features include:

Compression: On boxes from vendors such as NetScaler and Redline, compressing Web-based traffic to clients lets customers handle more transactions with less bandwidth or fewer servers.

Remote Direct Memory Access: On Crescendo’s Maestro switch, RDMA lets the switch bypass attached servers, processor and I/O, and directly access objects in server memory. This can let a data center support applications with less server hardware.

DoS mitigation: Products from vendors such as Cisco, Nortel, Foundry, NetScaler, Redline and others let Layer 4-7 boxes recognize unusual traffic patterns that might be DoS attacks and shut down those links.

medical documents firm’s LAN and across a WAN. They were receiving up to 300,000 transactions a month, says Henry Svenblad, CTO for ChartOne, “and our users, even on the LAN, were very unhappy.” On the WAN, it took up to four hours to complete some simple transactions.

Dual Redline boxes sit behind a router and VPN device in the ChartOne data center and in front of a switch, where the company’s ERP, e-mail and other application servers are attached. The Redline devices compress traffic bandwidth by up to 70%, which lets the PeopleSoft application and other networked applications run more quickly, Svenblad says.

In addition to the traffic compression, the Redline boxes act as a load balancer among the servers in the data center. The boxes also offload SSL encryption from the servers, which lets the PeopleSoft machines process application data instead of running encryption as well. Svenblad says the Redline boxes also handle encryption certificates, which lets him deploy a single certificate on the appliance, instead of on all servers using encryption. This saves some money (because he needs fewer certificates) and is easier to manage.

Performance is an issue

Svenblad says he chose the Redline device over NetScaler and F5 because of its performance and failover capabilities. He says he Redline appliance performed compression faster than the NetScaler in a test. The F5 device could not support an active/active configuration, where two boxes run simultaneously, with one taking over for the other in the event of a failure.

Market newcomer Crescendo recently introduced a box that more closely ties servers to the network layer.

The company’s Maestro switch is a Gigabit Ethernet switch that combines Layer 4-7 switching and TCP offload with Remote Direct Memory Access (RDMA) technology, which lets the switch pull objects directly from a server’s memory. RDMA lets the Maestro switch bypass the server’s I/O and processor to access a Web application running in memory.

Marsys, an application and server-hosting company in San Mateo, Calif., recently installed the Crescendo switch in its data center to speed up the dozens of Windows servers it manages for its clients. Instead of one application hogging the network, as with ChartOne’s PeopleSoft servers, Marsys’ data center was experiencing death by a thousand pings.

The servers in the data center were fitted with Gigabit Ethernet network interface cards (NIC), but most of the servers handled only about 10M to 15M bit/sec of traffic; it was the thousands of short TCP/IP connections that was bogging down server performance.

“Handling all those sessions, that’s what was killing our servers,” says Nader Shaterian, CIO for Marsys.

Shaterian put in the Crescendo switch and Gigabit network interface cards from Alacritech, which support RDMA. On the front end, the Crescendo box speeds up inbound and outbound traffic by offloading TCP connections and encryption from the servers to the switch. Between the switch and the servers, the RDMA feature lets the switch go in and grab objects that need to be served up from the server’s memory.

Scaling up

“It allows servers to scale better,” Shaterian says of the Crescendo box. “It offloads what is not really native to the server and handles those tasks on the front end.”

The combination of RDMA and TCP offload let Marsys reduce the number of servers it uses from five to one. Before, Marsys server administrators had to constantly rotate servers in and out as boxes became overloaded in terms of memory and processor usage.

Vendors such as NetScaler, Redline and Inkra garnered less than 6% of the \$511 million Layer 4-7 switch market in 2003 while Cisco leads the market with 40%, according to IDC.

But the market will see good growth over the next five years, as firms look to optimize data center network performance. IDC predicts the market will grow to almost \$800 million by 2008. ■

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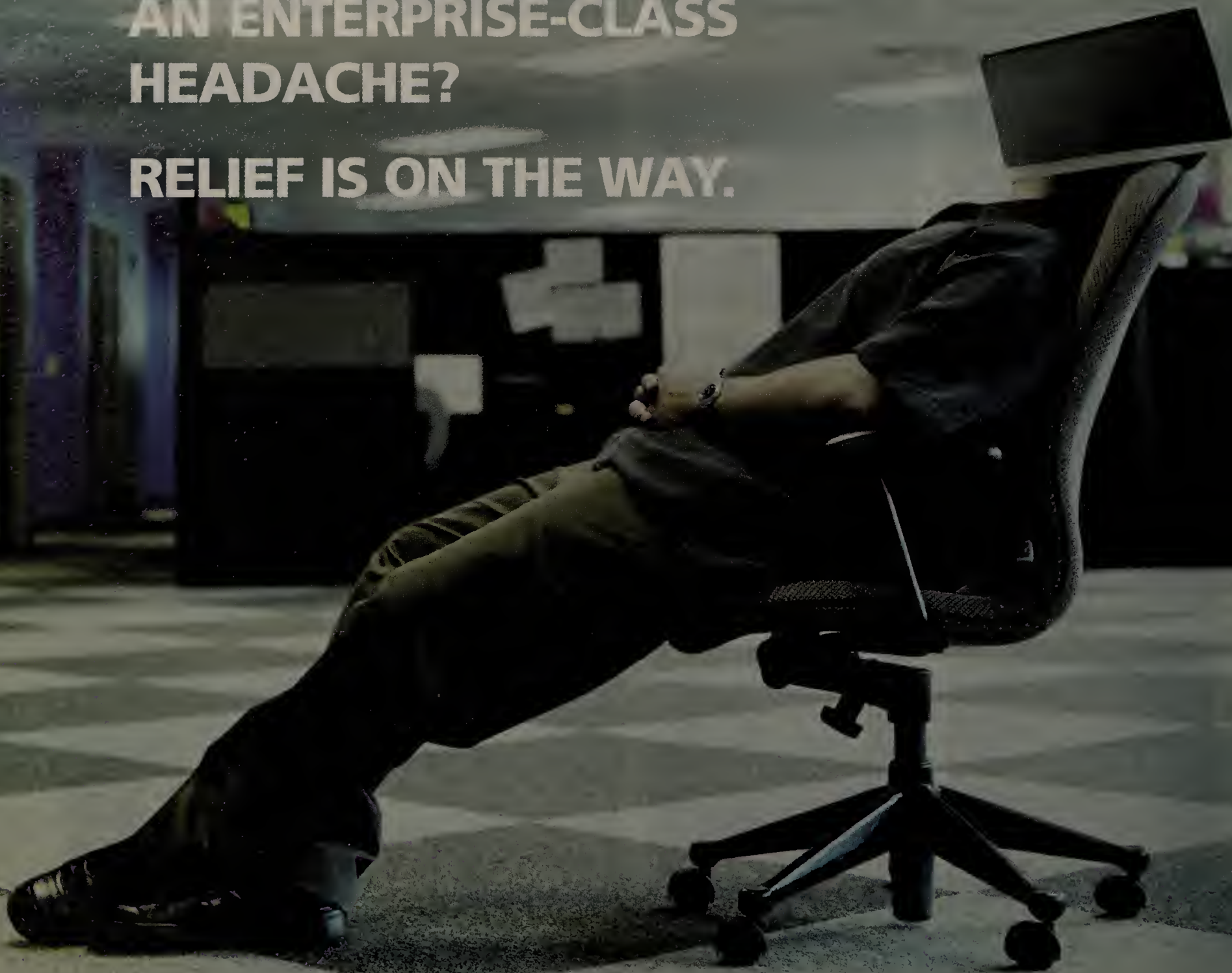
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Short Takes

■ **Microsoft** last week released a near-complete version of **Virtual Server 2005** for a final round of beta testing and said it still expects to ship the software this summer. Microsoft says Virtual Server 2005 will let multiple operating systems run on one machine and will come in Standard and Enterprise versions, which will differ only by the number of processors they support. Standard supports up to four processors, while Enterprise goes up to 32. Virtual Server supports Windows Server 2003, Windows 2000 Server, Windows NT, Linux, Unix and OS/2. The Virtual Server application itself runs only on Win 2003. Microsoft is targeting the virtualization technology at corporations looking to support legacy line-of-business applications running on older operating systems, most notably NT. Support for NT expires at year-end. Virtual Server 2005 will compete with similar virtualization technology from VMware and others. The software can be downloaded from www.microsoft.com/virtualserver.

■ A study commissioned by **Symantec** to gauge opinion about the **spam** problem among IT managers and their users points to a difference in views about how bad the volume of unsolicited mail really is. The survey questioned 110 IT managers in North America and 300 of end users about spam. The results, released last week at the NetSec Conference, showed almost 80% of the IT managers said spam is a workplace problem. However, about half the users said they didn't see spam as a problem at all. About 59% of the IT managers said spam has increased significantly over the last year, but only about 35% of end users felt the same. About 57% of IT managers — but about 68% of end users — said the spam situation was under control in their organizations. Both sides seemed to be skeptical that government legislation to address spam will not have any effect.

RFID standards shake out

Wireless technology seen taking on bigger role in supply chains.

■ BY ANN BEDNARZ

A slew of chip and transponder manufacturers are working to iron out the details of a new standard that will determine how radio frequency identification gear communicates in a supply-chain setting.

Standards development is key to RFID's adoption in supply-chain applications, analysts say. When standards become more solid, product development will speed up, which will drive down equipment costs, said Lyle Ginsburg, managing partner at Accenture, at a recent event hosted by IDC.

In supply-chain applications, each RFID tag carries an electronic product code (EPC), a unique identifier that can be associated with operational data such as an item's origination or the date of its production. EPCglobal is a nonprofit organization created by the Uniform Code Council and EAN International to commercialize EPC technology.

Developing standards is a key charter of EPCglobal — and a potentially contentious one.

Developing standards is a key charter of EPCglobal — and a potentially contentious one. Different working groups within the organization are fleshing out proposals for specifications ranging from RFID tags to middleware and data formats (see graphic, page 30).

These days, all eyes are on the activities of the EPCglobal working group responsible for recommending the Generation 2 (Gen 2) EPC protocol for the UHF band.

RFID operates in multiple frequency

ranges, including low (125 KHz), high (13.56 MHz) and UHF (868 MHz to 954 MHz). The second-generation UHF standard is getting a lot of attention because UHF is considered most suitable for warehouse environments, where many early adopters of RFID in the supply chain are focusing their efforts, says Christopher Boone, a program manager at IDC.

Spurring development of the second-generation UHF air-interface protocol is the need for multinational capabilities, flexible information storage and compliance with industry standards, Boone says.

UHF Class 0 and Class 1 chips are North American-based, and the developers didn't take into account whether the chips could work in other countries, where frequency availability differs, Boone says. Gen 2 chips will work in other countries, he says.

Additionally, early RFID chip development focused on designing small,

See RFID, page 30

BigFix bringing security to laptops

■ BY JOHN FONTANA

BigFix next month plans to upgrade its patch and configuration management software to support mobile laptops and help customers check computers for security holes before letting any devices onto a network.

The company will ship its Mobile Security Manager, an agent that sits on a Windows-based laptop and monitors patch, anti-virus and system configurations and keeps them up to date. The company also is introducing the BigFix Client Compliance API, which will let BigFix agents talk with software that assesses the state of a computer before letting it log on to a network.

The two new products are part of the BigFix Enterprise Suite, a platform for vulnerability assessment and remediation.

BigFix is part of a movement to bring mobile computers under the wing of patch and configuration management tools designed to keep a network secure. Laptops and other devices that are randomly connected to a network can introduce viruses and other malware if not properly monitored.

The company competes with the likes of Ecora, PatchLink, Shavlik Technologies, Configuresoft and St. Bernard Software.

"BigFix also is part of a broader trend to enforce policy before a machine connects to the network," says Trent Henry, an analyst with Burton Group. "Because of their flexible architecture, they can do vulnerability and patch management for mobile computers."

The flexibility comes from BigFix Fixlets, which are small messages that contain the intelligence to detect certain issues with computers and automate the repair of those issues. BigFix agents contain any number of Fixlets.

The Mobile Security Manager has nearly 50, including one that requires a laptop's screen saver to have a password and another that forbids the installation of file-sharing software. The Mobile Security Manager installs on the client laptop, and because it stores the Fixlets locally, it continues to monitor the system even while it is offline. The agent also can direct a user to a third-party Web site to download patches or virus signatures when a laptop has only a connection to the Internet and not the

See BigFix, page 30

The fix is in

BigFix next month will introduce software that monitors a mobile laptop's patch, anti-virus and configurations and keeps them up to date. Here is a look at the capabilities of the BigFix Mobile Security Manager.

- Enforces user-defined secure configuration for Windows mobile computers.
- Maintains secure computer configuration when using wireless networking.
- Enforces secure configuration of Internet Explorer browsers and Microsoft Outlook.
- Ensures anti-virus and personal firewall software is installed, running and configured properly.
- Allows direct-from-vendor patch and anti-virus downloads from any connection, including the Internet.

Companies team to reel in phishing

■ BY PAUL ROBERTS

A new consortium of companies from different industries has formed to tackle the problem of online identity fraud, better known as "phishing."

The Trusted Electronic Communications Forum (TECF) has representatives from leading retail, telecommunications, financial services and technology companies. The group will work with the U.S. and other governments, as well as standards organizations and companies, to fix problems such as e-mail and Web-site spoofing, which contribute to a fast-growing online identity theft problem, says Shawn Eldridge, TECF chairman and director of products and marketing at TECF member company PostX.

A number of leading companies have

signed on to the TECF, including some that have had their names besmirched by phishing scams in the past. Member companies include Best Buy, AT&T, Charles Schwab & Co., Fidelity Investments, IBM and Siebel Systems, the group said in a statement.

Representatives will form panels to develop long-term and short-term strategies to combat the phishing problem, including new technology and technology standards, best practices and legal action, against suspected identity thieves. There are few specific details about TECF's plans beyond those general goals because the group has just formed, Eldridge said.

The TECF will join other groups devoted to the phishing problem, including the Anti-Phishing Working Group, another industry consortium made up of financial institu-

tions, online retailers, Internet service providers and law enforcement. As opposed to that group, which tracks and reports on phishing scams, the TECF will focus more on developing and promoting standards that companies can use to combat phishing and to prevent the erosion of online commerce, Eldridge said.

In addition to working alongside other anti-phishing groups, TECF will consider recent proposals such as Microsoft's Caller ID specification and a proposal from Yahoo called Domain Keys, both of which are intended to eliminate e-mail spoofing, which spammers and those behind phishing attacks use. However, TECF has not yet taken a position on those technologies, Eldridge said.

A recent Gartner survey found that illegal access to checking accounts is the fastest-

growing type of U.S. financial consumer fraud, in part because of the growth in online scams.

Gartner surveyed 5,000 online U.S. adults in April. Based on the results of that survey, the company estimates that 1.98 million adults have experienced this sort of crime in the past 12 months, losing approximately \$2.4 billion, or \$1,200 per victim, to fraud, the company said.

Also in April, the Anti-Phishing Working Group said reports of phishing campaigns grew by more than 178% from the previous month, to more than 1,100 unique scams.

While many of the details about TECF have to be worked out, the group has set up a Web site at www.tecf.org.

Roberts is a correspondent with the IDG News Service's Boston bureau.

RFID

continued from page 29

inexpensive, read-only chips that can store a limited amount of information, such as a single EPC code, Boone says. That means every time a device reads an RFID tag, it has to send the EPC to operational systems to correlate the ID with item information.

Today, users are looking for more chip space — up to 256 bits — and the ability to add their own data to a readable and writable chip. That way a company could add customized data, such as its own item-numbering convention, to an RFID tag. Accessing that information later might not require a database lookup or any contact with an external system, which could improve performance.

"Users want to be able to put additional information on a tag as it goes through different events along the supply chain and localize that information so they don't always have to go back up to the network to get it," Boone says.

On the compliance front, this issue is compatibility with the international standard ISO 18000-6A. While the original tag specifications were not ISO-compliant, the

current Gen 2 proposals will be able to provide compatibility with key ISO standards, said Bernie Hogan, CTO of EPCglobal, at the IDC event.

So far, the Gen 2 working group has narrowed down multiple tag proposals to two options. Along the way, vendors have been forging alliances with like-minded competitors. As a result, longtime RFID players Intermec, Philips Semiconductors and Texas Instruments are the heavyweights backing one proposal, and supply-chain-focused newcomers Matrics and Alien Technology are the headliners behind the competing proposal.

Matrics and Alien have gained market leadership by default — UHF Class 0 chips are based on Matrics technology, and UHF Class 1 chips are based on Alien's.

All tests so far have used tags from Matrics or Alien, said Erik Michielsen, a principal analyst at ABI Research. But once the Gen 2 protocol is ratified, "those chips will be phased out and replaced with Gen 2 chips. So all the advantages those companies have will become decreasingly significant by the end of this year," Michielsen said in a statement.

The backers of the winning proposal will

be in an enviable position, because they will be able to set up their design and fabrication capabilities more quickly than the others, Michielsen said. "If [Texas Instruments] and Philips win, they'll have their designs and will be ready to have their fabs built, and they can immediately start producing hundreds of millions of these chips," he said.

Meanwhile, the backers of the losing standards could suffer delays of a month or two, especially if they outsource fabrica-

tion, Michielsen said.

The teams still are trying to settle on one proposal. But if the working group doesn't reach a consensus soon, EPCglobal will bring in an independent team to make the decision, Hogan said. The current timetable calls for the working group to publish a draft of the next-generation EPC tag design during the summer and EPCglobal to ratify a draft standard in early October.

Boone says he expects to see Gen 2-compliant tags and readers by year-end. ■

Standards play

The first round of RFID standards addresses numbering, middleware, data formats and directory architecture — in addition to the multiple air interface-specific standards in development.

Tag Data Specification 1.1

Description: Defines specific encoding schemes for serialized versions of Uniform Code Council-based identifiers, such as global trade item number, serial shipping container code and global location number.

Status: EPCglobal board-ratified specification.

Reader Protocol 1.0

Description: Defines the communications messaging and protocol between tag readers and EPC-compliant software applications.

Status: First public working draft available; updated September 2003.

Savant Specification 1.0

Description: Defines the services Savant performs for application requests within the EPCglobal Network. Savant is middleware that sits between tag readers and enterprise applications.

Status: First public working draft available; updated September 2003.

Physical Markup Language Core Specification 1.0

Description: Establishes a common vocabulary to be used within the EPCglobal Network and a standardized format for data captured by readers.

Status: Auto-ID Center Recommendation as of September 2003.

Object Name Service (ONS) Specification 1.0

Description: Defines how the ONS is used to locate metadata and services associated with a given EPC.

Status: First public working draft available; updated August 2003.

BigFix

continued from page 29

corporate network.

While BigFix can find and correct problems, it can't enable or disable access to a network if a machine is not secure. To bridge that gap, BigFix is introducing an API that will let other products such as network access gear or an operating system talk to its agents. The agents will be able to communicate whether a laptop meets security and configuration policies as defined by BigFix. The network gear or operating system can use that information to grant or deny access. Companies such as Cisco already have such "network

admission control" software and Microsoft plans to add similar capabilities it calls "isolation" to its operating system. The intent is to keep computers off the network if they can't prove they are secure and have installed up-to-date anti-virus and patch software.

"What we need is another agent to ask us if the BigFix agent is done and then provide the controls to enable or disable access," says Gregory Toto, vice president of product management for BigFix.

While BigFix's mobile software works only with Windows laptops initially, Toto says the company plans to add support for mobile phone and PDA platforms in the future. ■



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Estimating the cost of a Windows Armageddon

Some of the folks who predicted, accurately it turned out, that the Internet would be subject to "Warhol Worms" are at it again. This time they say one carefully planned worm attack could cost U.S. businesses more than the gross domestic product of Guatemala within a few hours.

In their latest paper, "A Worst-Case Worm" (see www.nwfusion.com, DocFinder: 2528), researchers Nicholas Weaver and Vern Paxson explored the possible worst-case damages from an Internet-based worm attack on Windows. They assumed that the attackers would be working for a country that wanted to cause economic harm to the U.S. (there do seem to be more than a few candidate countries these days) and use an unreported vulnerability in Windows.

They also assumed the attack would be designed to do as much harm as it could, including destroying the data on the disk and destroying the boot ROM where possible. They say the worm would be programmed to use different attacks on different vendors' systems and be smart enough to recognize that it had infected a laptop but not destroy it until the laptop was reconnected to a network, such as one behind a corporate firewall. Such an attack could infect as many as 50 million computers far faster than the vendors of virus checkers could react.

Even though the authors put the cost of damage to home PCs at zero, they came up with the estimate of \$50 billion worth of damage for one well-planned attack. The damages could be a lot higher. Stuart Stanford, co-author with Weaver and Paxson of the "Warhol Worm" paper (see "Doing better than Andy," DocFinder: 2529), felt that damages could be "substantially larger."

The estimate in the paper was discussed on the Nanog mailing list (see DocFinder: 2530) and some people disagreed with

the \$50 billion estimate. But even if the actual damages were only half that, we still are talking about real money.

So now we are scared. What should we do? The authors of the article do not offer any magic shields. They suggest that the ability to rewrite boot ROMs be physically disabled where possible, but that's a lot of work and only reduces the potential impact. The hypothetical attack in the article used a yet-to-be-discovered flaw in Windows SMB/CIFS file sharing. But SMB/CIFS is at least as much of an example of the kind of target as it is a prediction. As we find out constantly, there are many possible targets in a system as complex as Windows.

Not to be a fatalist, but I don't see any way to eliminate the risk of a major attack like

the one Weaver and Paxson describe any time soon. Microsoft (finally) has internalized the message that security is more important than ease of use when ease of use, as interpreted by Microsoft, has meant leaving the barn door open by default.

A major message from Microsoft's current security road show is that Windows XP Service Pack 2 disables rather than enables things by default. That will help, but Windows is complex and there are many security holes yet to be discovered.

Disclaimer: Even for Harvard, \$50 billion is real money, but the university did not comment on this topic — I did.

Bradner is a consultant at Harvard University's University Information Systems. He can be reached at sob@sob.com.

Microsoft unwraps Win XP Service Pack

■ BY JOHN FONTANA

After a few notable delays, Microsoft finally has shipped the latest beta version of Windows XP Service Pack 2, which the company has touted as a major milestone toward developing more secure software.

The second "release candidate" of the service pack, which more resembles an upgrade to the 2-year-old operating system, was made available last week at www.microsoft.com/sp2preview/.

Microsoft says the final release of the service pack is expected this summer. It originally was planned for the first half of this year.

The company released the first beta of XP SP2 in December, followed by Release Candidate 1 in March. Release Candidate 2 was originally planned for last month, but Microsoft was said to have delayed the release to fix some bugs and correct some compatibility issues. For months, Microsoft has warned corporate users that SP2 will break some applications. The company has implored users to thoroughly test applications against the service pack.

The application issue is most prominent in the Windows Firewall. The firewall is turned on by default and will disrupt communication for existing applications, such as remote administration and patch management tools, performance monitors and other tools that communicate via file-and-print sharing channels, hard-drive shares that operate over specific ports, and peer-to-peer and file-sharing programs.

The firewall can be configured to permit those communications, but users will trade security for those conveniences.

Also, new security restrictions placed on Remote Procedure Call and Distributed Component Object Model services, which are often exploited by worms and viruses,

could choke applications. New memory protection features also might hamper performance and stifle code generated by just-in-time compilers.

Those issues and others, such as recurring exploits of the Windows operating system, have generated a lot of hubbub over XP SP2.

"We are not lying in wait for this service pack," says Roy Haschenburger, president of Alternative Computers, an IT contractor to government organizations in Denver. "It's a non-issue right now. We have tested it and haven't seen any real positive or negative impact. People are concerned with day-to-day issues and such things as worms, rather than worrying about Microsoft coming up with something that might improve the [operating system] and make it more robust and stable."

Microsoft has touted those goals, along with security, for XP SP2.

In addition to the Windows Firewall, key highlights include safer Web browsing features including enhancements to Internet Explorer to block popups and unintended downloads; memory protection to reduce buffer-overflow vulnerabilities; and safer e-mail and instant messaging through better protection against malicious attachments and Instant Messenger file transfers. Also, the Messenger Service, a network administration tool that spammers use to send pop-up ads to users, will be turned off by default.

For corporate users, several of the XP SP2 features can be administered through Active Directory Group Policy.

Microsoft says hundreds of thousands of developers and business customers have tested beta and release candidate versions of XP SP2 through Microsoft's technical preview, technical beta and Microsoft Developer Network programs. ■

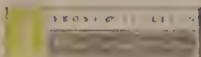
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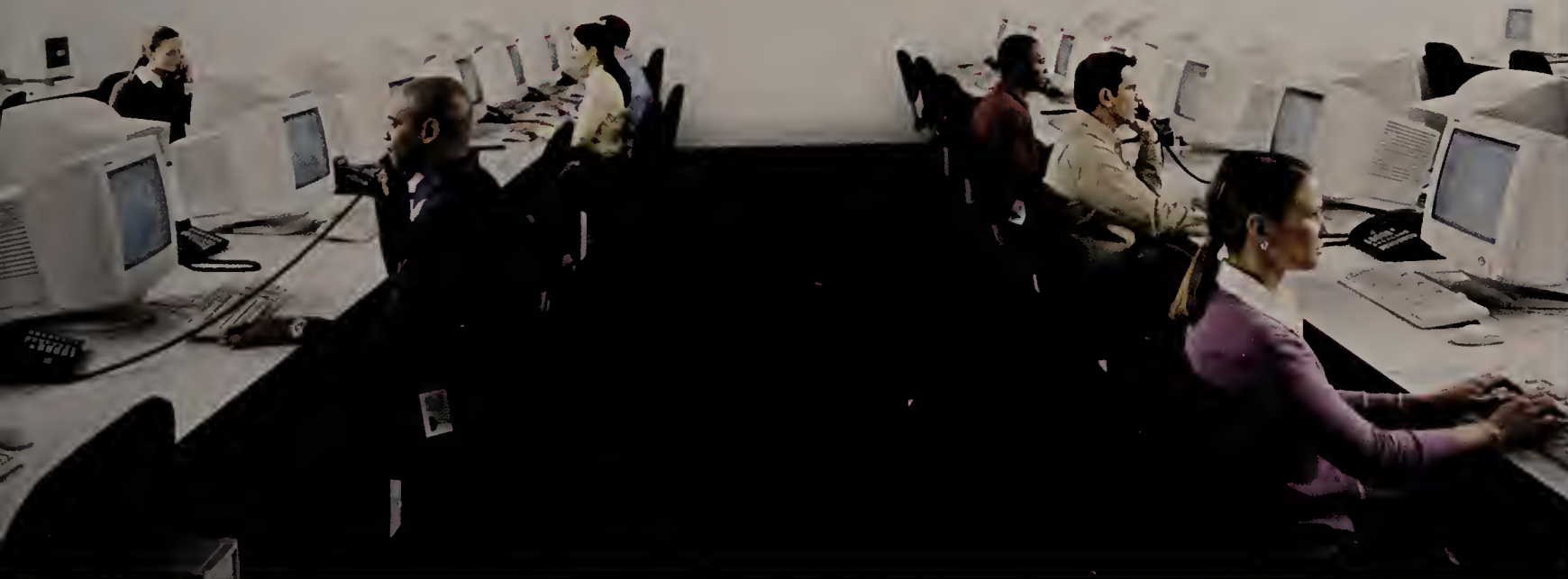
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LIMITING THE PLENUM CABLE FIRE RISK

WHITE PAPER

Overview

Concerns are rising about the growing amount of cables in commercial buildings required to service the ever increasing demands of IT networks. More workstations, each with expanding capabilities and increasing bandwidth requirements, are taxing our communications infrastructure. Communications cabling, which carries important data packets to and from computer rooms, is as common in building plenum spaces as duct work. While most cable selections are based on electrical performance requirements, there are fire rating factors that are often overlooked beyond what is minimally required. This fact places each building at a greater fire risk with each new installation of communications cable. As a result, much discussion in the industry has been focused on the new NEC 2002 which calls for the removal of the accessible portion of abandoned cabling. These concerns are also the thrust behind the genesis of a new cable technology that significantly reduces these fire safety risks.

National Codes and Standards

The communications cable most often used in commercial buildings is called "plenum" cabling. It is designed for use specifically in hidden spaces within dropped ceilings that handle return airflows — the plenum space. The National Fire Protection Association, (NFPA), sets the plenum cable requirements based upon three mandatory attributes: smoke generation, flame spread, and fuel load. In the early to mid 70s, several significant fires occurred where cable running in plenum spaces greatly increased the severity of the fire damage (such as One World Trade Center, 1975). As a result, a consortium of industry partners convened to address cabling types used in this application. In the early 80s, the NFPA Committee 90A, responsible primarily for developing standards for the HVAC plenum space, issued primary requirements for all materials "exposed to the air flow" to be non-combustible or "limited combustible." Technically speaking, a limited combustible material is categorized as having a smoke generation index of less than or equal to 50 (as compared to red

oak which has a smoke generation index of 100), a flame spread index of less than 25, and a potential heat (fuel load) of less than 8.1 mega Joules/kilogram. The fuel load is the heat energy contained in a cable that could be released in the event of a fire. At this point in history, while many communications cables were tested, none passed such stringent flame, smoke, and fuel load requirements while also meeting the electrical performance outlined by the National Electrical Code (NEC) and the Telecommunications Industry Association (TIA). The result of this testing and development was a compromised selection (*allowed only as an exception* to the original NFPA ruling) based on the best cable construction available at the time — which was combustible in nature and hazardous with respect to smoke generation levels. Over 25 years later, this selection of combustible cable still represents the plenum cable we know today. But, times have changed and the cabling industry is now able to meet NFPA's original challenge with a new, safer cable for use in plenum spaces — Limited Combustible Cable.

Differences in Materials Equal Differences in Fire Safety

One of the core challenges the cabling industry has faced has been finding materials that excel simultaneously at three, often divergent, goals: 1. Excellent electrical insulation properties on copper and fiber, 2. Reasonable processing parameters for cable manufacture, and 3. High ratings on flammability, smoke generation, and fuel load. The three most commonly used materials in cabling today are (acronyms for each polymer material can be found on cable data sheets):

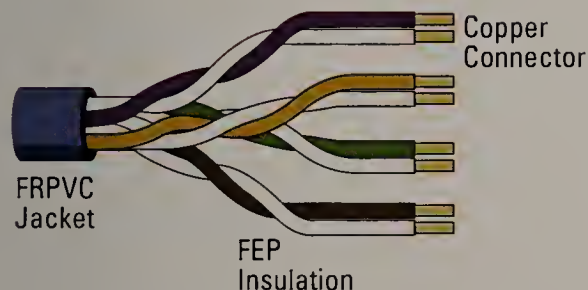
- Polyethylene (PE)¹
- Polyvinyl chloride (PVC)¹
- Fluorinated ethylene propylene (FEP)

When comparing the performance of each, polyethylene (PE), offers excellent electrical properties for insulating copper. However, in a fire, it is highly combustible, extremely high in fuel load, and readily generates dense smoke, which creates significant

life and equipment fire safety hazards and risks. Polyvinyl chloride (PVC) has poor electrical properties but offers better fire performance than PE; yet, it alone is difficult to melt process and has poor flexibility in cable applications. To resolve these issues, other materials (such as lead) are added to achieve greater processability, flexibility, and aging stability. The resultant PVC compound represents an inexpensive material that creates a relatively safe jacket for most plenum cables, but remains combustible in nature. Lastly, fluorinated ethylene propylene (FEP), marketed by DuPont as Teflon® has electrical insulation characteristics on copper equal to polyethylene and *only* FEP meets the highest performance criteria for flame spread, fuel load, and smoke generation.

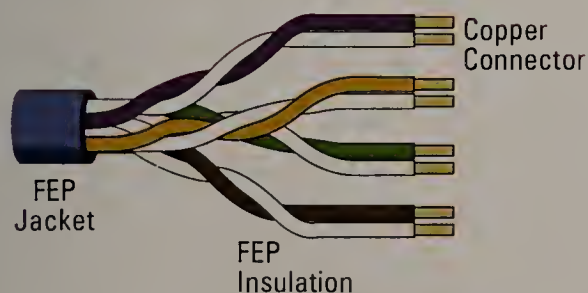
The construction of a typical 4 pair UTP (unshielded twisted pair) plenum cable is shown in Figure 1. It contains FEP as the copper insulator and a FRPVC jacket.

FIGURE 1. PLENUM (CMP) CABLE



In contrast, the limited combustible cable encompasses several improvements that include optimum fire-rated materials of construction, as well as cable size reduction (10% smaller jacket). A typical limited combustible cable construction is illustrated in Figure 2.

FIGURE 2. LIMITED COMBUSTIBLE (LCC) CABLE



Limited Combustible Cable

Through a collaboration among industry customers, competitors, suppliers, and research firms such as UL and NFPA's Fire Research Foundation (NFPRF²), the limited combustible cable construction has finally arrived. The 2002 NFPA 90A recognizes this cable requirement and listing as approved for use in plenum spaces. The NEC is currently in the process of reviewing the limited combustible technology and specific applications may be established as early as the 2005 edition, setting it up for broad acceptance in the future. Limited combustible cables significantly exceed the flame, fuel load and smoke ratings of today's minimal code-approved exception cables, enough to earn the limited combustible rating. In addition, they must pass a full array of other tests, including temperature aging, humidity, and jacket slitting, all of which may compromise the plenum cable safety and the integrity of data signals over time. Finally, these cables are made with less total plastic and because only one type of stable plastic (FEP) is used they are more easily recycled.

Many leading cable manufacturers including Belden, Mohawk, Krone and CommScope currently offer 4 pair UTP, coaxial, and fire alarm limited combustible cables made with DuPont™ Teflon®. The enhanced 4 pair UTP constructions come in everything from Category 3 to 6e (TIA Standards). The average increase in total installation costs of a system that includes limited combustible cables is less than 10% compared to conventional plenum cable. Limited combustible cable made with Teflon® may also save additional money if local codes require plenum sprinklers in sprinklered buildings (see your inspector and NFPA 13). For more information on this new technology, check with your local distributors and contractors, or contact DuPont at: **800-207-0756** or www.teflon.com/cablingmaterials

¹ There are several different formulations of PVC jacketing materials and PE insulations used in this industry.

² The NFPRF is the National Fire Protection Research Foundation, a research firm associated with NFPA.



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Service Providers

■ THE INTERNET ■ EXTRANETS ■ INTEREXCHANGES AND LOCAL CARRIERS
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Takes

■ **AT&T** last week announced that it has won a contract valued at \$1.7 million to build a 20-site IP VPN for Nexfor, a Canadian forest products company. AT&T Global Services Canada is migrating Nexfor's three frame relay networks onto one fully managed Multi-protocol Label Switching IP VPN service. The network will be used to support the company's financial, sales, mill management, health and safety, intranet and bar-coding applications. AT&T also is providing dedicated Internet access and remote-access support for Nexfor's 6,500 employees. AT&T has a 10-node MPLS network across Canada, which is part of the carrier's Global Network that spans 130 cities in 48 countries.

■ Technology services firm **NaviSite** has finalized its acquisition of application service provider **Surebridge**, adding application management expertise in Microsoft, PeopleSoft and Siebel Systems software to its services portfolio. Under terms of the deal, NaviSite acquired the assets of Surebridge in exchange for two promissory notes of \$39.3 million, 3 million shares of NaviSite common stock and the assumption of certain liabilities. NaviSite has undergone an internal restructuring and acquired several companies, including managed messaging firm Interliant and content delivery network provider Conxion, since the beginning of the year.

■ **Fujitsu** has lined up reseller arrangements with **Hammerhead Systems**, **CoSine Communications** and **Atrica**. Under the agreements, Fujitsu will sell and support Hammerhead's multiservice edge switch; CoSine's IP services switching products; and Atrica's Optical Ethernet transport equipment. The companies are part of Fujitsu's FASST portfolio of Fujitsu and third-party products designed to migrate Tier 1 service providers and cable companies to packet-based infrastructures and services. Fujitsu is an entrenched SONET vendor to U.S. RBOCs.

Carriers mull impact of rulings

Some consider price hikes, service cutbacks in wake of UNE-P decisions.

■ BY JIM DUFFY AND
DENISE PAPPALARDO

While industry experts call their concerns overblown, some alternate local carriers are predicting higher prices and possible service cutbacks while mulling a future without network-sharing regulations that have limited their costs.

A Washington, D.C., appeals court in March had ordered an end to portions of the FCC's unbundled network elements platform (UNE-P) policy. A string of efforts by competitive local exchange carriers (CLEC), including AT&T, MCI and Sprint, to overturn the ruling have been blocked — the latest being Supreme Court Chief Justice William Rehnquist's refusal of a petition for a stay of the court's decision.

UNE-P is a regulation in the Telecommunications Act of 1996 designed to give competitors access to the local-access network, which is dominated by the RBOCs. Under UNE-P, RBOCs were to sell access to their local facilities to CLECs at government-determined rates in exchange for entry into the long-distance business.

Now that UNE-P has been all but dissolved, RBOCs are expected to raise wholesale local facility leasing rates to CLECs, which would raise retail fees. RBOCs and CLECs now will negotiate commercial wholesale arrangements while the FCC considers an alternate regulatory framework.

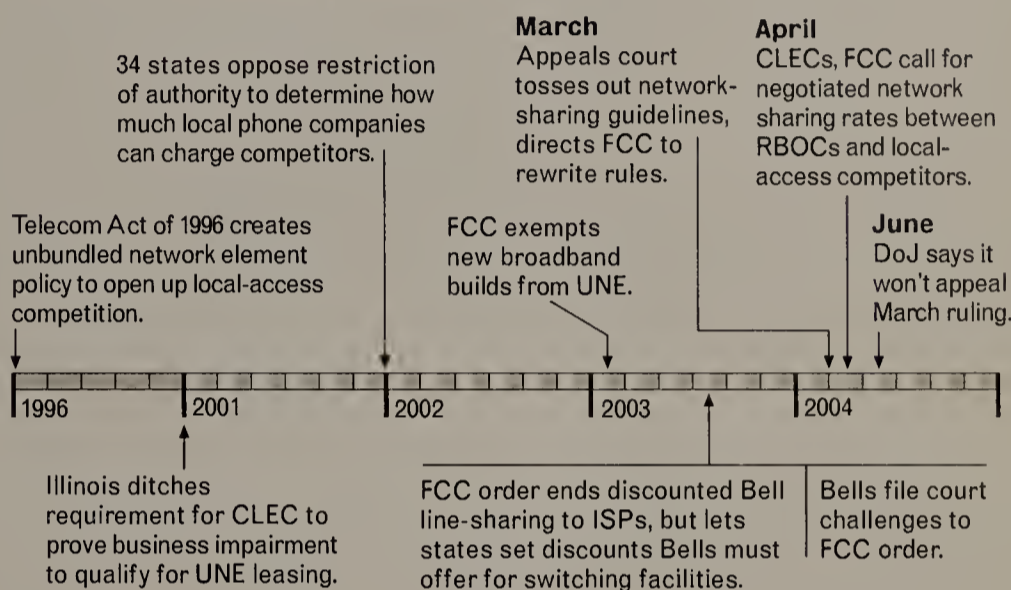
"We are still sorting out the details of our various business relationships and how those might be impacted," a Sprint spokesman says. "In general, we don't think the UNE-P decision will have a significant impact in our overall plans on the business or consumer side, but we haven't reached a consensus on the details yet."

MCI says it is too early to say for certain if the decision will affect business service pricing.

"If the FCC's rules are allowed to lapse and wholesale rates rise, MCI may be

UNE-P's evolution

Hallmarks in the life of government-mandated local-access wholesaling.



forced to raise prices in some markets and pull out of others," said Stasia Kelly, MCI executive vice president and general counsel, in a written statement.

According to AT&T, the regulatory course undoubtedly will lead to higher prices and then some.

"It confirms that the [Bush] administration has set the industry on a path to higher prices, less competition, fewer jobs and depressed investment," says a company spokesman. The ruling reportedly already has forced AT&T to consider

See Ruling, page 36

Verizon-Vodafone union may be put to the test

■ BY JOHN BLAU

It's not as if Vodafone Group and Verizon Wireless have had a rocky relationship in the U.S. The two companies actually have enjoyed a successful partnership that has generated billions of sales and millions of customers.

The problem is that the European mobile phone giant dislikes partnerships; it prefers instead to gain full control of companies to pursue its own branding, pricing and "seamless" service strategy, especially in the enterprise customer market.

Vodafone drove home that message in February when it made an unsuccessful bid for AT&T Wireless Services. The mobile phone group was prepared to unload its 45% stake in Verizon Wireless to acquire a rival and become its own boss

in the huge and strategically important U.S. market.

Now the relationship between Vodafone and Verizon Wireless could be tested again.

Vodafone has until Aug. 9 to decide whether to cash in on its stake in the U.S. mobile phone company. Under a put option, which was exercisable for the first time last year and will continue every year in an agreed two-month window through 2007, Vodafone can require Verizon Communications to pay as much as \$20 billion for its 55% stake in the venture, in two equal payments.

Vodafone has kept its cards close to its vest ever since the put option went into effect June 10.

"We didn't comment on the put option last year, and we aren't commenting on it

See Vodafone, page 36

■ Read two columnists' views on the shakeout from the solicitor general's decision. **Johna Till Johnson**, page 36; **John Dix**, page 78.

EYE ON THE CARRIERS

Johna Till Johnson



Thank God for the cable companies. Yes, I know that sounds bizarre. But the June 10 decision by Solicitor General Ted Olson not to appeal a ruling on FCC local competition basically means that unless something changes, cable companies are the strongest positive force for telecom competition.

Back in March, the Court of Appeals for Washington, D.C., struck down a ruling by the FCC that gave the states authority to regulate unbundled network element pricing (UNE-P).

You'll recall that unbundled network elements are the bits and pieces of the physical network that the incumbent local exchange carriers (ILEC) have to lease to competitive LECs (CLEC) to let

Regulatory path leads back to the bad old days

them provide broadband access. Regulating the rates effectively ensures that the CLECs can provide broadband profitably to customers.

By striking down the ruling, the court of appeals said, in effect, that it wasn't sure the FCC should be in the business of regulating rates at all. (This is a simplification, but that's the gist.) By refusing to appeal, the solicitor general threw in the towel and gave the court the last word.

Why does this matter? It's not a dumb question: Recent news analyses suggest that technologies such as VoIP have made the UNE-P discussion obsolete. Such thinking is wrong.

What's at stake here is who controls the broadband connections that make the delivery of services such as VoIP possible. Think about it: Nobody does VoIP over a standard 56K (stet) phone line. To run voice and data concurrently, you need broadband connectivity — which typically means DSL or cable.

So here's why UNE-P is still relevant: If

Recent analyses suggest . . . VoIP has made the UNE-P discussion obsolete. Wrong.

the RBOCs can charge whatever they want, third-party providers of DSL services will be forced out of business. That means the competition for broadband boils down to cable (and other broadband alternatives) vs. DSL. In effect, we're reducing the number of potentially competitive players from three (ILECs, CLECs and cable) to two.

I know I'm about to get deluged with e-mails complaining that the UNE-P rates are usurious and forced the poor little RBOCs to sell their networks at less than a fair market rate. Get real: If the FCC-mandated rates really had been that bad, why

wouldn't SBC, Verizon and the rest have taken major advantage of the opportunity to gouge the competition?

If Verizon is forced to sell its circuits at below-market rates, that represents a windfall to SBC, Qwest and BellSouth — which are all ostensibly seeking the opportunity to compete with Verizon on its own turf. Yet they didn't because the truth is, the RBOCs don't really support competition.

The great thing about the status quo was that it let the RBOCs keep out competitors. UNE-P threw a spanner into the works and introduced true competition into the market.

Bottom line: If you like higher prices, longer waits for broadband and the slower rollout of services, rejoice. The rest of us can pray for the cable companies to have a great year.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

Ruling

continued from page 35

exiting local service in some states.

Analysts, however, say any price hikes will be negligible and felt mostly by consumers and small to midsize businesses (SMB).

"The number of customers who are affected by these types of relationships are not enormous," says Thomas Nolle, president of consultancy CIMI. "It tends to be

more the SMB than it is the enterprise."

That's because CLECs such as AT&T and MCI that serve large companies usually have their own facilities on which to provision services to those companies. Nolle says these carriers have facilities serving corporations in the 150 largest metropolitan areas in the U.S.

On the other hand, smaller businesses and branch offices of larger companies are in the same boat as residential users: If

a CLEC provides their local service, it is over lines leased from an RBOC or incumbent LEC.

Observers don't think any potential price increases will happen overnight because current contracts have to expire.

"I don't think it's going to be cataclysmic, only because the incumbents don't like bad publicity any more than anybody else does," says Lynda Starr, an analyst at Probe Group.

SBC says it will hold the line on wholesale pricing at least until year-end.

"SBC has committed to no unilateral increase in mass market UNE-P prices, as well as loop and high-capacity transport between SBC's offices as a result of this ruling," the RBOC said in a statement.

"We look forward to working with the FCC as the industry transitions to a regulatory model that puts its faith in free markets and consumer choice, where the competitive market — not government rules — will protect consumer prices," the carrier added.

BellSouth says it also will not move aggressively to hike rates.

"We have offered our wholesale customers an opportunity to lock in today's rates until the end of the year and set stable rates through 2007 by negotiating and signing a new long-term agreement with us," says Herschel Abbott, BellSouth vice president of governmental affairs. "We will redouble our efforts to negotiate these agreements."

Price hikes will vary on a market-by-market basis because the public utility commissions in every state will have a say in what the cost should be, says Ken Twist, an analyst at RHK.

But in the long run, any price increase for anyone will be inconsequential, according to Nolle.

"You're going to see no significant impact on service pricing," he says. "Generally speaking, access pricing is going to go down over time because we're going to transition from circuit-to-packet mode access." ■

Vodafone

continued from page 35

this year," a Vodafone spokesman says. "What we are saying, however, is that we are satisfied with our partnership in the U.S."

That might be true, but even Vodafone CEO Arun Sarin admits he's open to change — if the conditions are right. "Nothing is imminent, but everything is possible," he said at a media conference last month when asked about the partnership.

If Vodafone decides to unload its stake, he wouldn't have to look hard for a buyer.

Verizon Communications (stet) has made no secret of its desire to gain full control of its wireless unit, which is the most profitable part of the group.

"The ball is in Vodafone's court, but we have made it very clear to the company that if they want to sell part or all of their stake in Verizon Wireless, we will buy whatever they have to sell," says Bob Varettoni, a spokesman for Verizon Communications.

If Vodafone cashes in its stake for \$20 billion, what can it buy in the U.S.?

T-Mobile USA has comparable GSM technology and is small enough to afford, but its owner, Deutsche Telekom, is keen to expand its own position in North America, according to Richard Dineen, wireless research director at Ovum. The other operators, Cingular Wireless, Nextel and Sprint are either too expensive or have incompatible Code Division Multiple Access technology or both, he says.

Dineen sees little incentive for Verizon Communications to sell off its wireless subsidiary.

"It makes no sense for Verizon to get rid of the jewel in its crown," he says. "A fixed operator like Verizon with a mobile subsidiary can hedge against mobile phone substitution, which, together with VoIP, is eroding its core voice business."



“Nothing is imminent, but everything is possible.”

Arun Sarin
CEO, Vodafone

Even if the marriage between Verizon Wireless and Vodafone isn't the easiest, it's convenient and, no less important, it's highly profitable, according to Dineen.

"The best thing for Vodafone is to maintain the relationship," he says. "It really doesn't have many options at the moment but then in this industry, you never really know."

Blau is a correspondent with the IDG News Service's Dusseldorf, Germany, bureau.



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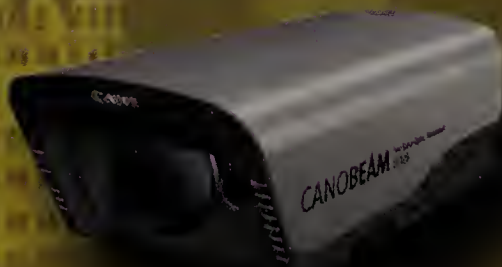
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Editorial supplement

NetworkWorld

June 21, 2004

The New Data Center

4th
in a
six-part
series

Rethinking networked IT

SPOTLIGHT
ON
VoIP

The future is all about convergence, with voice and data on equal footing in the new data center. Inside, you'll find tips for building a fail-safe VoIP network, plus insights on new applications and more.

PLUS: VIRTUALIZATION STRATEGIES
What do server virtualization vendors HP, IBM, Sun and VMware have in store for your new data center?

NEW DATA CENTER PROFILE
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The New Data Center

Rethinking networked IT

The future is all about convergence, with voice and data on equal footing in the new data center. In this, the fourth in a six-part series, we spotlight tips for building a fail-safe VoIP network, the new applications VoIP enables and more.



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Now that voice has become just another application on the network, brace yourself for a slew of new communication apps.

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HP, IBM, Sun and VMware are charging up their server lines with virtualization. Understanding how each approach would work in your new data center is no easy task.



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Now that voice has become just another application on the network, brace yourself for a slew of new communication apps.

Voice as application



■ BY JULIE BORT

The day is near when VoIP will be as ubiquitous as the Internet itself. Sure, issues aplenty must be solved first — e911, quality of service, the political rift between telecom and datacom staff. But as traditional PBX switch vendors begin rolling out their own VoIP offerings, and yes, even evangelizing them, few now can doubt VoIP's trajectory.

The time has come to ask what happens after IP becomes the standard for voice transport. The answer, in short, is new applications. Think of it — when voice is just another packet on your network, not only will the network be converged, but so will the devices. You then will treat voice like any other mission-critical application in the new data center.

Joan Vandermate, Siemens vice president of product development, offers the example of opening a new office. No longer will users have

to choose between deploying a PBX/key system — because all sites need their own — or Centrex. With VoIP in the new data center, network executives instead will roll out voice as a service. They simply will install a VoIP gateway on the premises, and presto — “everyone’s on one, big, virtual system. In much the way you deploy SAP or any mission-critical application [you don’t deploy SAP at every site], you would do for voice. You would put voice applications in the data center and simply deploy them as data

ILLUSTRATION: DAN PAGE



services or even as [outsourced] managed services. You deploy [the PBX] inside the glass house and administer it there — whether you have one campus or 10,000 sites,” Vandermate says.

With that in mind, the time has come for network executives to begin plotting business applications enabled by this new-data-center-style voice. Experts say the following applications — which were previously cost-prohibitive or just plain impossible — will become widely adopted.

Voice with presence. This is a supersized version of the “work anywhere” feature that VoIP users already enjoy. VoIP users can tote a laptop with a soft phone to home or hotel, and when they fire up their VPN connections, bang, they’re on the voice network. Such mobility is one of the primary reasons a VoIP installation is underway at the Texas Association of School Boards (TASB), says Rick Tillotson, telecom manager for the Austin organization.

VoIP greatly will improve voice service for the roughly 40 TASB employees who either travel or telework part time. “They’ll have three different numbers — for their office, home and cell phones — and customers are having to dial three numbers just to reach someone. Call a home number, and calls don’t roll to anyone live — that’s horrible, that’s caveman call-handling. We want to treat employees [always] like they are across the hall — transfer calls, have one voice mail box — that’s the No. 1 advantage we find when we go to VoIP,” Tillotson says.

With the addition of presence, which vendors already have begun to integrate into their products, users get fine-tuned, call-routing control. They’ll be able to set their presence information to tell the IP PBX and other users which callers are allowed to reach them, when and how — via voice or by instant messaging, for example.

A user could set a device to accept only instant messages during a meeting except if a customer calls, in which case the call would ring through.

Such an application would be a natural fit for TASB, Tillotson says. He has enabled presence in the call center, via Siemens ProCenter Agile product. “Empowering agents is huge. They can now see who else is logged in and

what their status is. They are no longer standing up and shouting out to the [agents monitoring the] queue, ‘Can I go to bathroom?’” he says. Rather, all agents can check the queue themselves to see how many callers are waiting, then look at the icon list and see the availability of their co-workers — with out-of-office icons being specific enough for agents to know when to expect the agent’s return (vacation, bathroom, printer). “If they see four agents left and four people in the queue, they know it’s not a good time to go on break,” he adds.

Presence has been such a boon to the call center that Tillotson can imagine making it available to all employees once VoIP is fully rolled out. TASB’s staged rollout is planned over the next two years, he says.

Presence-aware VoIP applications are becoming available now for use outside the call center, as long as callers are on one VoIP system. Products that offer various presence-enabled capabilities include Alcatel’s 4980 soft phone, Avaya’s Converged Communications Server, Mitel Networks’ Your Assistant Pro 3.0, Nortel’s Multimedia Communication Server 5100, ShoreTel’s Call Manager and Siemens’ OpenScape VoIP application suite.

Click to conference. In addition to letting users set their call-routing options, presence naturally will lead to more advanced functions. One such emerging application is “click to conference,” such as offered in Mitel’s Your Assistant Pro.

Click to conference is “an incredible productivity enhancement. It is changing the way people do business,” says Ed Mier, founder of testing specialist Miercom and a *Network World* Lab Alliance partner. “It’s now possible for workgroups — five to 10 people — to maintain a visual indication of where the other members are and their availability. It eliminates phone tag, and taking three days to set up a conference call. You can look at your screen and see that four of the five people you need are available now.” For instance, with Your Assistant Pro 3.0, an end user would initiate the call by simply dragging and dropping icons into a conference screen. When the phone rings, the four people available for the call automatically would be conferenced in. An icon for the fifth person would indicate expected availability time. “You can’t do that in a non-VoIP environment,” Mier says.

Click to talk. VoIP also will be the impetus that makes the “click to talk” concept introduced during the Internet bubble days a reality. While VoIP connectivity needs to be more widespread among consumers before companies can interact with their Web visitors this way, creative VoIP users already have begun experimenting. The Bahá’í National Center, the U.S. headquarters for the nation’s Bahá’í houses of worship, is building a quasi click-to-talk system that will integrate with its public-facing Web site, says John Fletcher, CIO for the Wilmette, Ill., nonprofit.

The organization staffs a far-flung cadre of call-center volunteers. (This, too, VoIP has made possible. These volunteers can work part time from their homes anywhere in the country, while the IP PBX easily routes calls, Fletcher says.) His staff is writing an application that will let Web site visitors who wish to talk to a live person initiate a phone call. The visitor would enter a phone number, and a call-center employee would call back nearly immediately. The application will perform a look-up of the call-queue time — information the ShoreTel IP PBX already gathered for incoming calls. In this way, the Web site can tell the interested visitor that a Bahá’í representative will call back in x number of minutes. “There isn’t a whole lot to it. Our programmers are writing the interface between the [ShoreTel] system and the Web site,” he says.

As services evolve that let consumers use VoIP more widely, real “click to talk” will evolve, too, eliminating the call-back process. Standards for service and device compatibility are important, too. Most in the industry are looking toward the IETF’s Session Initiation Protocol (SIP) as the enabling standard.

“SIP has a window of opportunity over the next 18 months to become the ubiquitous IP communication standard and is very much in the public domain,” Mier says. He points out that vendors’ acceptance of SIP ranges from implementing it in their phones/soft phones (Avaya) to architectural-level support (Nortel).

But others are not so sure that SIP will win. SIP is too “heavyweight and clumsy” for handheld devices, says Ed Basart, CTO for ShoreTel. The IEEE’s older H.323 remains in the protocol-of-choice race and eyes also are watching the Media Gateway Control Protocol (also known as MGCP or Megaco). The IETF and ITU jointly created the MGCP.

Regardless of the choice, vendors seem willing to support standards for IP telephony, rather than implement only via proprietary methods. That is a positive sign for click-to-talk and other applications for reaching consumers.

My fantasy is not that you add voice to an application but that you add applications to your voice calls.

— Ed Basart, CTO, ShoreTel

Voice of the future

Here are the top 10 indications that VoIP has become ubiquitous:

No. 10 During a phone call with your mother, she instant messages you her meatloaf recipe.

No. 9 You and your spouse splurge on matching jeweled, Star Trek-like, voice-activated cell-phone pins.

No. 8 In the last eight hours you attended 12 meetings, two of them simultaneously — one via instant messaging and the other a phone call. Two of your co-workers also attended both meetings.

No. 7 The latest office rumor is that your computer-simulated database agent is dating the boss’ computer-simulated database agent.

No. 6 You notice that in the last 30 days, you haven’t been put on hold for any phone call to any company.

No. 5 During your last business-oriented golf game, you conducted a collaborative conference with your vendor — who was playing on a different course.

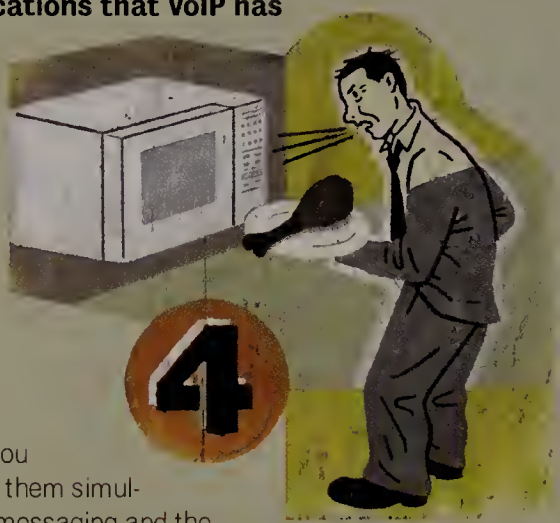
No. 4 After pulling an all-nighter at work, you had a brain-dead moment when you tried to voice command your microwave into cooking your dinner.

No. 3 After that, you picked up your phone and tried to conference call your microwave.

No. 2 While at a party, you settle an argument about an all-time baseball record by calling a friend and having him download all the relevant statistics to everyone’s PDAs.

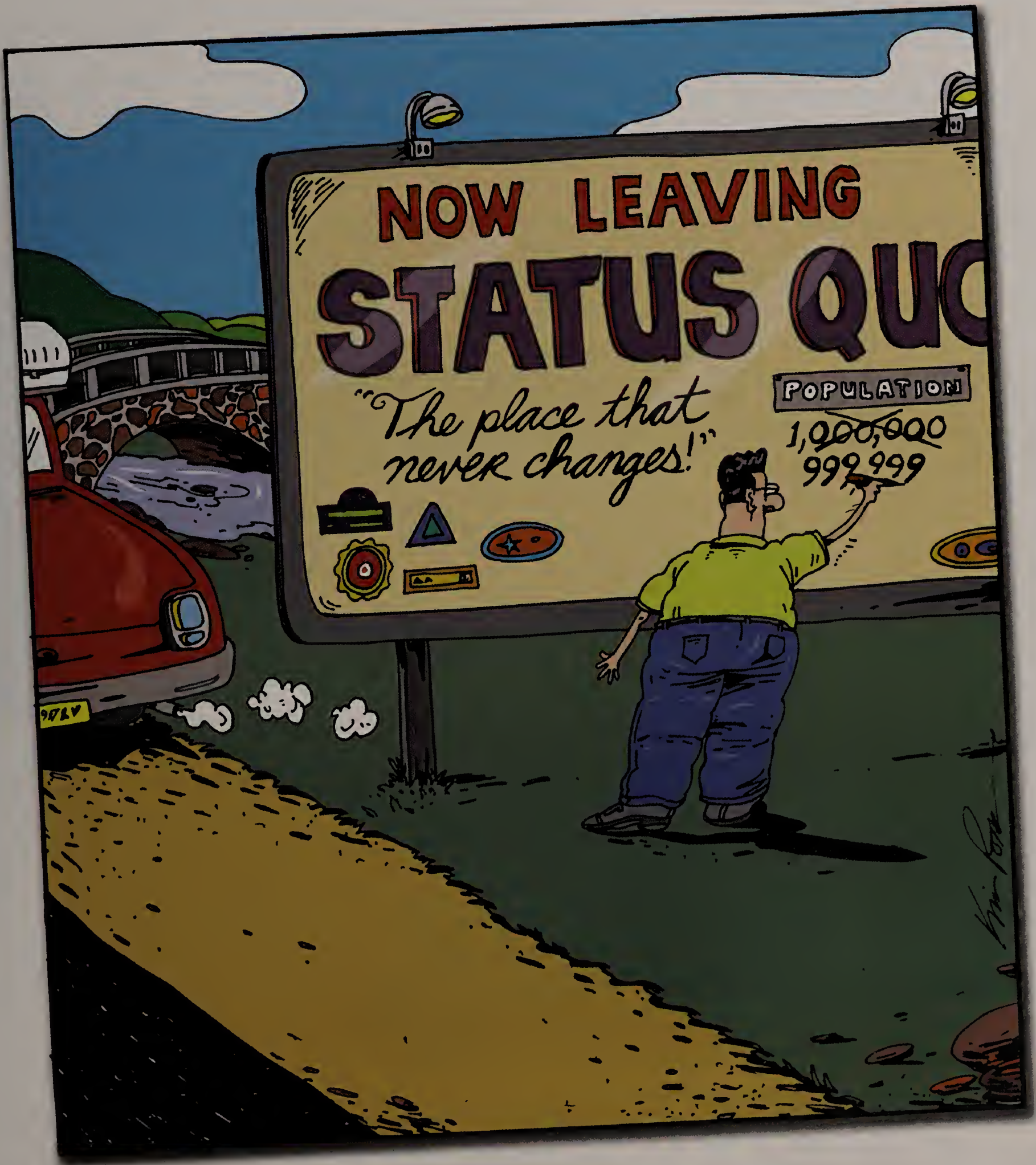
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— Julie Bort



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Voice

continued from page S4

The always-present expert. Consumers aside, combine presence with the click-to-talk concept and you wind up with an application called "Ask the Expert," Basart says. This lets front-desk or call-center

employees be in constant contact with high-paid knowledge workers. Basart offers the example of an investment bank. When a major customer calls with a question on the account, if that customer can't be routed directly to the broker, the call would go to another knowledge worker who has the expertise to answer the question. No voice

mails, no phone tag, no forcing the customer off on a live call-center person who can do nothing more than take a message.

The device-smart app. Another application a presence-aware IP PBX eventually might support is device smarts, Basart says. "My fantasy is not that you add voice to an application but that you add applications

to your voice calls," he says. "I get excited to think about it. This will make a telephone call far more simple; you can just share something on a screen."

Some of the communications suites vendors offer today let users on the same IP PBX drag-and-drop a file to share it with other callers, or to launch a whiteboard. This is a productivity booster, eliminating the hoopla required to e-mail presentations and materials ahead of time, users and experts agree. But that's not the real trick. Basart foresees a device-smart application in which the voice system would detect the data capabilities of the devices on the call, and automatically modify data files to fit the user interface.

For instance, a conference leader using a PC could tell that three others on the call were also on their PCs but that one participant was using a PDA/cell phone. If the leader wanted to send a full-blown spreadsheet or presentation during the call, he would know that the PC users could view the entire file while the PDA/cell phone could see a reduced version that the IP PBX automatically formatted for the smaller screen.

Voice control, integrated lookups and beyond. Other applications will become popular business tools with the mass adoption of VoIP, too. These include voice control and integrated directory lookups.

With all the hardware fully capable and users trained to use data devices for voice calls, speech recognition applications seem a natural next move, says Naresh Lakhanpa, a national director of business innovation for Deloitte & Touche. "Voice interaction is going to be big. 'Get me this document.' Taking this to the extreme, you'll have the ability to interact with an electronic agent that understands voice commands and can go perform tasks," Lakhanpa says.

In fact, the Ray and Maria Stata Center at the Massachusetts Institute of Technology recently demonstrated just such an agent. The agent was a computer-generated image of a woman that performed database look-up tasks via conversational speech. She was so life-like, some attendees initially thought they were viewing a video.

Less sexy, but a nice productivity booster all the same, will be integrated directory lookups where users, via keyboard or speech recognition, can initiate communication — be it a call or e-mail/instant message by entering the person's name. Calendaring, too, would be integrated.

And then, TASB's Tillotson envisions the day when these two apps combine, and all the world's data is accessible with a voice query. Equipped with a wearable device that recognizes only the user's voice, the user would be able to make database queries that are presented via a screen image projected into the air, he says. "I've seen this stuff in labs. . . . If you're at a party and can't remember a restaurant, you can find it immediately — it will be integrated into our lives."

Perhaps one day the motto for VoIP will be: Don't leave home without it. ■

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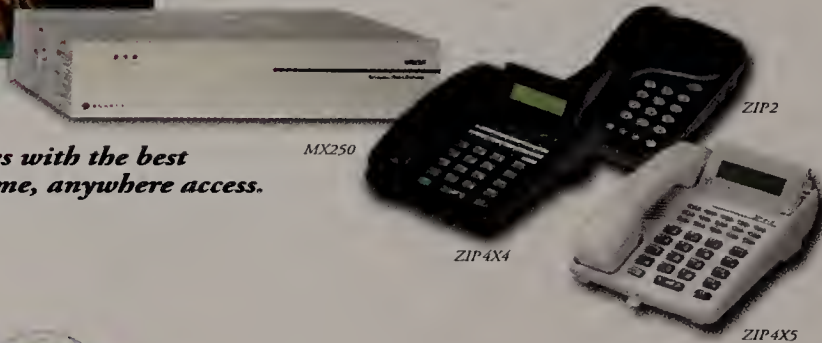
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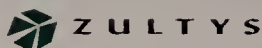
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These guidelines will help you create an ultra-reliable IP telephony infrastructure.



Getting to the vaunted five nines

■ BY PHIL HOCHMUTH

IF you had to choose, what could you live without: dial tone or e-mail? That's not a choice network executives want to make. But forced into it, most probably would pick a failed e-mail system as the lesser of two evils. They know a phone network gone dead on their watch is the quickest route to the unemployment line.

That fear has been the pall hanging over VoIP for years. "The network is down" is not an acceptable explanation when it comes to phones. For that reason, many companies have been reluctant to bet their telecom infrastructure on commodity servers, IP WANs and phones plugged into Ethernet switches.

But as companies evolve to the new data center model of computing, the benefits of replacing disparate PBX and key telephone system hardware throughout a corporation with a centralized cluster of IP PBXs are getting harder to ignore. Hosted and managed from the glass house, voice can be treated just like any other application. Plus, these days, reliability doesn't have to be an issue, experts and experienced users say.

Achieving Ma-Bell-like reliability with VoIP simply means building a network with redundant call-processing hardware and gateways, providing ubiquitous power backup, and implementing best practices in security, patch management and virus protection.

Architecting five nines

First, understand your bandwidth requirements, says Ray Ortega, voice and video infrastructure consultant with ThruPoint, a New York integrator that has installed IP voice and data networks for many large companies. IP PBXs, network gear and IP phones all can be up and running, but poorly engineered bandwidth can lead to congestion and make the VoIP network as useless as if an IP PBX or router had crashed.

Ensuring that doesn't happen starts by selecting the right codec, or compression method, for encoding and decoding packetized voice. The ITU-standard G.711 codec, which compresses VoIP to 65K bit/sec, makes sense on LANs, while the G.729 codec, with 9K bit/sec compression, is

suited for lower-bandwidth T-1 or broadband shared WAN links, Ortega says. Some vendors promote the use of other ITU codecs — such as G.722, which supports higher-frequency voice — but the G.711 and G.729 are the most widely deployed, he adds.

"It comes down to determining what quality a customer wants," Ortega says.

Redundancy of switches, routers and call processors should be the next consideration in your VoIP blueprint.

"We try to split the load across the two active servers," Ortega says of the converged networks ThruPoint has architected for companies such as Deutsche Bank, Merrill Lynch and Morgan Stanley. Load-balanced IP PBXs, available from vendors such as Avaya and Cisco, can run in one data center or in separate data centers, in case a primary site is cut off. When choosing the latter, Ortega adds, you must take network latency into account. WAN links must be measured for delay and jitter; delay greater than 100 millisecond could cause a problem with voice quality.

For IP telephony, getting to 99.999% reliability also means making sure power to the VoIP network isn't lost. Traditional PBXs supply power to phones, requiring only the phone switch to be on a back-up power supply. But with IP telephony, you need to think about power backup for

the servers, as well as the LAN switches and WAN routers. Many of the latest IP phones can be powered via power-over-Ethernet switches, but earlier models might need to run off of AC adapters with battery backups.

Uninterruptible power supplies (UPS) — basically giant batteries — are available for all components of a VoIP network. Coverage can range from 15 minutes of back-up power to many hours depending on the types of devices used. "If businesses want to sustain hours of phone service through a blackout, they have to plan differently

See Five nines, page S10

"We're tweaking and adjusting the [VoIP network] to a point where it almost takes care of itself," says Bill Miller, desktop services manager for Nevada County, Calif.



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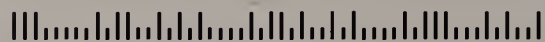
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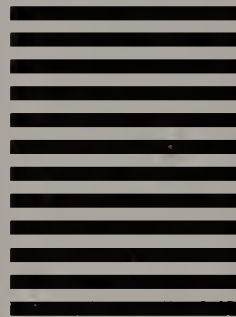
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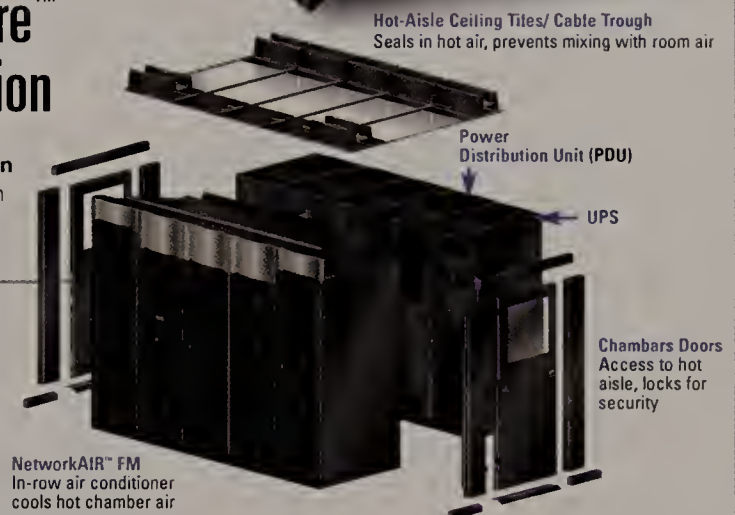
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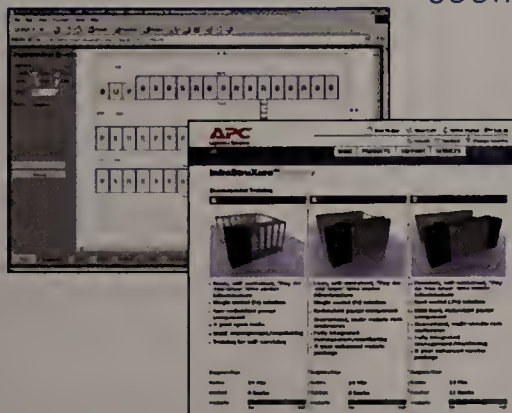


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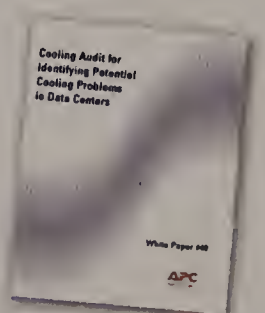
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Five nines

Continued from page S8

than if they're just trying to survive a quick glitch," Ortega says.

Planning for at least one hour of power backup is a good idea, Ortega suggests. Longer-running battery backup is available but can be overkill. He notes, however, that for hospitals, public safety organizations or government offices that cannot go offline, generators usually are needed.

Putting plans into practice

Use of such best architectural practices has kept the Nevada County, Calif., VoIP network running for the last two years with only 5 minutes of downtime. And the downtime, for system maintenance, was planned, says Bill Miller, desktop services manager for the county.

For starters, Miller uses virtual LAN (VLAN) technology to make sure voice does not contend with data for bandwidth. In the data center, the server farm hosting e-mail and office applications plugs into a 3Com Switch 4007 Layer 3 switch. Another Switch 4007 connects redundant 3Com SuperStack NBX 750 IP PBXs, which provide voice service to 600 county workers. These redundant NBXs sit on separate subnets. The live one is accessible to the network, and the backup is on its own VLAN (see graphic, below).

"If someone can't get through to the schools or city hall because the phones are out, I'm the one who gets kicked around," Miller says.

If the primary NBX were to fail, Miller would receive an alert on his pager

and by e-mail. He then would change the IP address on the back-up NBX to the same number as the primary one that failed. He also would switch the VLAN of the backup to the main voice subnet.

Miller closely monitors the voice network using VoIP monitoring and management appliances from start-up Qovia. Should he ever need to use the backup NBX, for instance, "We are currently working jointly with 3Com and Qovia to go out and tickle all my IP phones to do a reboot," he says. "When they would reboot, they would look for the [live NBX]. I'd be back up within 20 minutes without having to leave my house."

Using the Qovia tools, he also can set alerts on traffic activity and error messages on IP PBX and WAN equipment, and monitor T-1 cards on the county's voice gateways. The Qovia devices send e-mails to the IT staff if the equipment has an unusual number of error messages — usually the warning just before a crash. SNMP-enabled UPS hardware from APC also lets Miller tap into the health of his power back-up equipment.

"We're tweaking and adjusting the [VoIP network] to a point where it almost takes care of itself," he says.

Servers at the core

Of course, ensuring reliability of the VoIP network is only half the story. The other half deals with the operating system for the VoIP server.

"Suppose you have an IP PBX with triple redundancy in a nuclear shelter. If it's running on an unpatched version of Windows NT, there's a huge vulnerability," says Bob Rosky, senior security consultant at ThruPoint.

Rosky has several recommendations for making sure the server operating system doesn't cause reliability or security problems for VoIP. First make sure your VoIP server runs an absolute minimum number of services.

As to the type of operating system, "it's like asking if a Ford is safer than a GM," Rosky says. "It's how you drive it. Clearly, there are more vulnerabilities in Windows than in an AIX-type of [operating system]. But that's because there are a hundred times more [Windows] systems out there. The [operating system] should not be the No. 1 factor in deciding on an [IP PBX], but it can be a huge caveat if not implemented correctly."

Cisco, for example, ships its Windows 2000-based Media Convergence Server (MCS) platform for the CallManager IP PBX software with a custom-built Windows image that minimizes the services, applications and background software of the operating system.

Plus, when Microsoft issues patches for the servers, Cisco tests the patches and issues its own version of the software fixes on the MCS. "We tell our customers not to apply Microsoft's patches. Not all modules are on our systems, and some of the patches from Microsoft could cause more problems than they solve," says Bill King, the vendor's technical marketing manager.

Cisco also has hardened the MCS platform, which runs the CallManager IP PBX software, to make it as reliable as big-iron PBXs, King says. The hardware has built-in redundancy throughout, with dual Intel Xeon processors, memory, network interface cards, power supplies and disk drives with RAID configurations.

"When you add the software that's been pre-tested and pre-certified, with all the patches, it makes for a highly available combination," King says.

Still, for those IT executives who don't trust Windows for voice reliability, Cisco has plans to port CallManager to Linux later this year while continuing to support and enhance CallManager on Windows.

Inside the box

Vendors of legacy PBX gear also are embracing the commodity hardware and software architectures used on IP PBXs, but taking the same cautious route they took with the old, proprietary, monster phone switches.

"Our high-grade telephony systems have redundant capabilities throughout," says Mark Bissell, product manager for IP telephony at Nortel. Even the latest versions of Nortel's TDM-based Meridian 1 PBX use Intel processors and commodity disk drives and other components. Nortel offers IP PBXs that run on Intel-based hardware, with software ranging from embedded Unix, to Windows and Linux on various systems.

Nortel would not have thought to put its telephony applications on Intel servers a few years ago, but the component landscape has changed, he says.

"The newer generation of PC-based hardware is becoming extremely reliable," Bissell says. "When you combine that with redundant architectures, we're finding that we can make them as reliable as the proprietary systems." ■

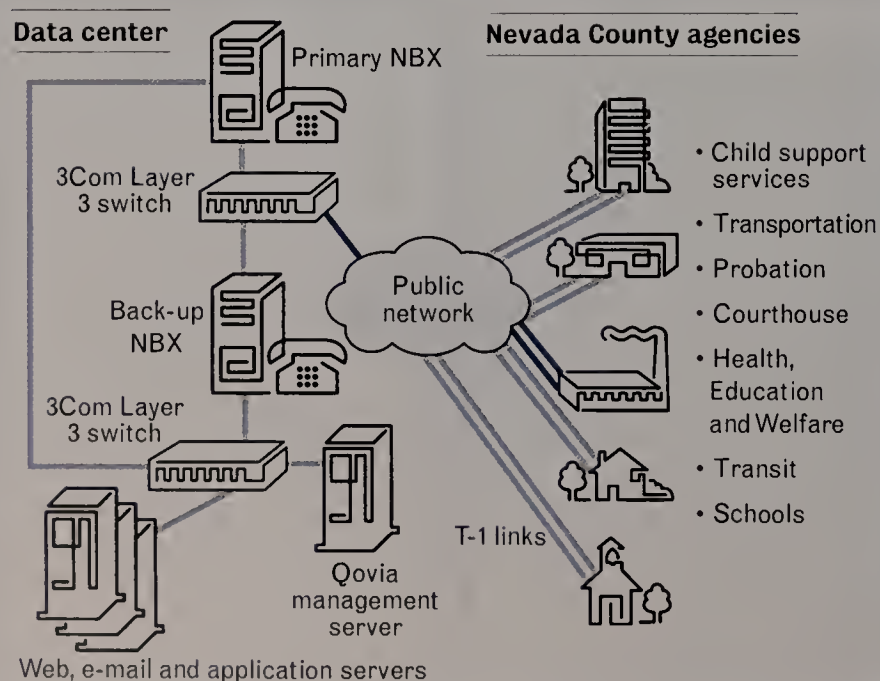
Five rules for five nines

VoIP network designers share this advice for building a fail-proof infrastructure for IP telephony.

- **TEST THE NETWORK:** Determine IP traffic bandwidth availability, jitter and delay before deploying.
- **DUPLICATE:** Run redundant call-processing servers and separate them geographically if possible.
- **DUPLICATE, AGAIN:** Make sure call-processing servers themselves have redundant processors, network interface cards and disk drives.
- **PATCH OFTEN:** IP PBXs are servers, so keep them updated with the latest operating software fixes.
- **BATTERIES INCLUDED:** Plan on back-up power supplies for call processors, routers, switches and phones.

Architecting VoIP survivability

Nevada County in California builds in redundancy at the IP PBX and in the WAN to keep its VoIP network available at all times.



SOURCE: NEVADA COUNTY

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VoIP Lessons learned

Two users share their hard-learned tips for deploying centralized VoIP.

■ BY PHIL HOCHMUTH

As a consumer of financial services, you probably couldn't care less whether your stockbroker is talking to you over VoIP or that the loan officer processing your mortgage application uses a PC-based softphone instead of a desktop handset. But to the purveyors of such services, this behind-the-scenes technology is making all the difference in the world for their operations. By placing IP PBXs in the new data center and turning voice into just another IP application, financial services firms are cutting costs on equipment, traditional voice services and telecom management. At the same time, they're becoming more flexible and efficient.

VoIP experts at two such firms — global financial powerhouse Lehman Brothers and Master Financial, a home-loan-approval firm — tell us what they've learned along the way.

Lehman Brothers: Easier disaster recovery

Lehman Brothers provides voice service to a global employee base from clusters of Cisco CallManager IP PBXs that reside in redundant data center facilities in Manhattan and Jersey City, N.J. The firm began its foray into VoIP with a 50-phone IT pilot project in early 2001. That morphed by mid-year into a 1,000-seat deployment for the firm's investment bankers. Now, the VoIP network has grown to more than 8,000 IP phones in the New York area, the U.K. and Japan. John

Manville, vice president of network services at the New York firm, takes away these five lessons from his three years of managing this large-scale VoIP deployment. The first, and the hardest learned, came out of the Sept. 11 attack.

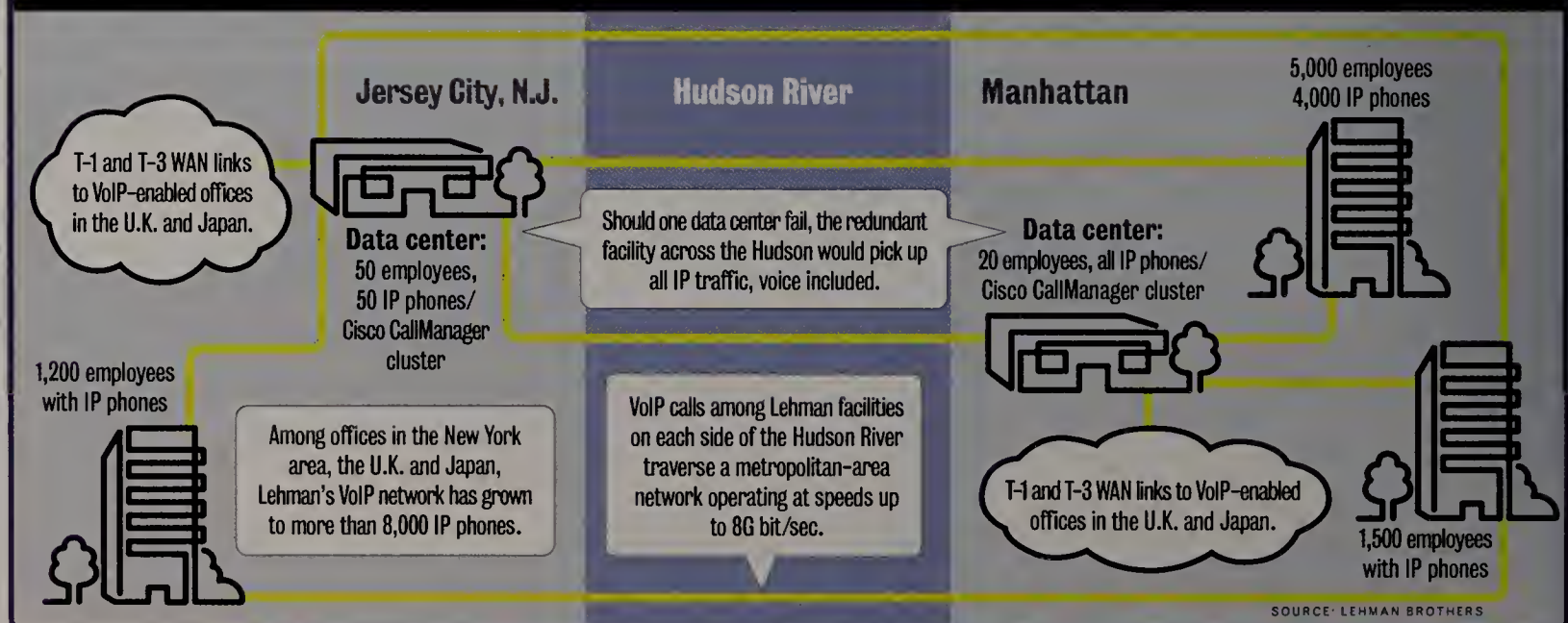
1. IP telephony proves its worth for disaster recovery.

With all of Lehman's offices and its New York data center destroyed in the Sept. 11 catastrophe, the firm learned the real value of VoIP only months after providing its first IP telephony services. Despite the devastation, business continued at Lehman, via the company's disaster-recovery data center in New Jersey. The remote back-up site hosted all applications — voice and data — for ad hoc

See Lessons, page S14

Big city VoIP

From the thousands of VoIP-enabled employees to the ultra high-speed metropolitan network over which their calls traverse, there's nothing small about Lehman Brother's VoIP deployment.

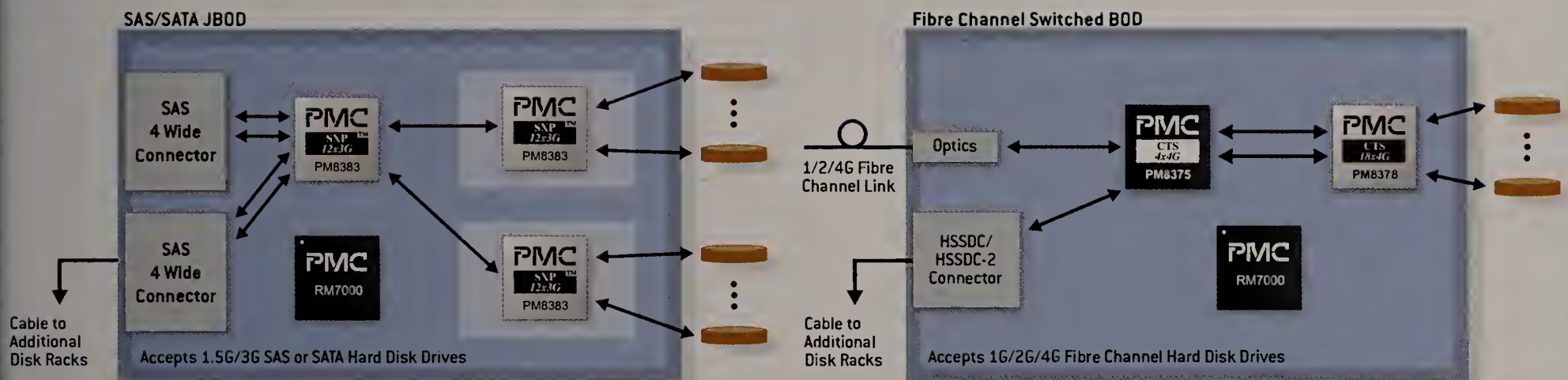


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Lessons

continued from page S12

offices in Manhattan. As Lehman employees spread out to a number of buildings around the city, including hotels, their IP data and voice calls traversed Lehman's metropolitan-area network, 10G bit/sec dense wavelength division multiplexing links spanning the Hudson River.

"We found that IP telephony was the quickest way to get people set up and also to let them keep their phone numbers," Manville says. "We had people in Sheraton hotels with Category 5 wires running across the floor, but they were able to work."

2. IP telephony can lead to operational cost savings, but not necessarily at smaller sites.

Lehman has saved about 30% on hardware costs over

the last several years by using more flexible IP PBX gear and phones than TDM PBXs, Manville reports. The firm has shaved several million dollars from its IT budget by eliminating costs incurred because of Centrex-related moves, adds and changes. "In the New York area, we've seen a lot of cost savings," he says.

But Manville cautions that cost savings have not been as dramatic in smaller installations as they have in the major metropolitan area. "It's been kind of a wash," he says of Lehman's VoIP effort at branches connected to its CallManager clusters.

3. A killer app? No such thing.

Productivity applications such as unified messaging are a hit with employees, but the savings aren't as impressive, Manville says. "There really are no killer applications for IP telephony that we've found. It's more of a buildup of

smaller applications and benefits that make the system as a whole valuable," he explains.

4. Larger deployments can bring out the bugs.

Lehman's IP PBXs got buggy when it took VoIP into the 5,000- to 8,000-phone range, Manville says. The most serious was a delay in dial tone. But, he adds, Cisco came on site and quickly squashed the major CallManager bugs.

5. Get everyone on board.

A major factor in Lehman's IP telephony success is that the telecom and datacom staffs rallied behind the technology. "It's very, very important to get everyone totally on board with the project," Manville stresses.

This even extends to the vendor. "In our case," he says, "we got the CEO of Cisco to come in and tell us that we would be supported."

Master Financial: Strong business lessons

Few companies doing VoIP have faced issues on a scale that Lehman has. But smaller firms also are learning the VoIP ropes. Chris Mullins, CIO at Master Financial, shares three lessons his Orange, Calif., firm has learned from its venture into VoIP.

1. Converged applications boost productivity, the bottom line.

When Master Financial decided to make the VoIP plunge, plunge it did. The 350-person company — about the size of a minor branch office in a firm such as Lehman — threw out not only its old phone systems, but also the phones themselves. Master Financial recently replaced Avaya key telephone systems in its Denver, Jacksonville, Fla., and Orange offices with dual, redundant Spherical IP PBXs from Sphere Communications. Instead of deploying slick, new IP phones to all desktops, the firm decided on software-based phones, or softphones, from Sphere. "Over a three-day weekend, we took out all the Lucent/Avaya phones in the offices. On Monday, everyone came in and had no phone on their desks," Mullins says.

The Spherical server pair, which runs in the company's data center in Orange, connects to a unified messaging server application from Sphere. The application, CallExpress, combines voice mail with Microsoft Outlook e-mail to give all employees one PC inbox for voice mail and e-mail, Mullins explains. Unified e-mail, voice mail and faxing let agents handle more applications and get documents to customers more quickly.

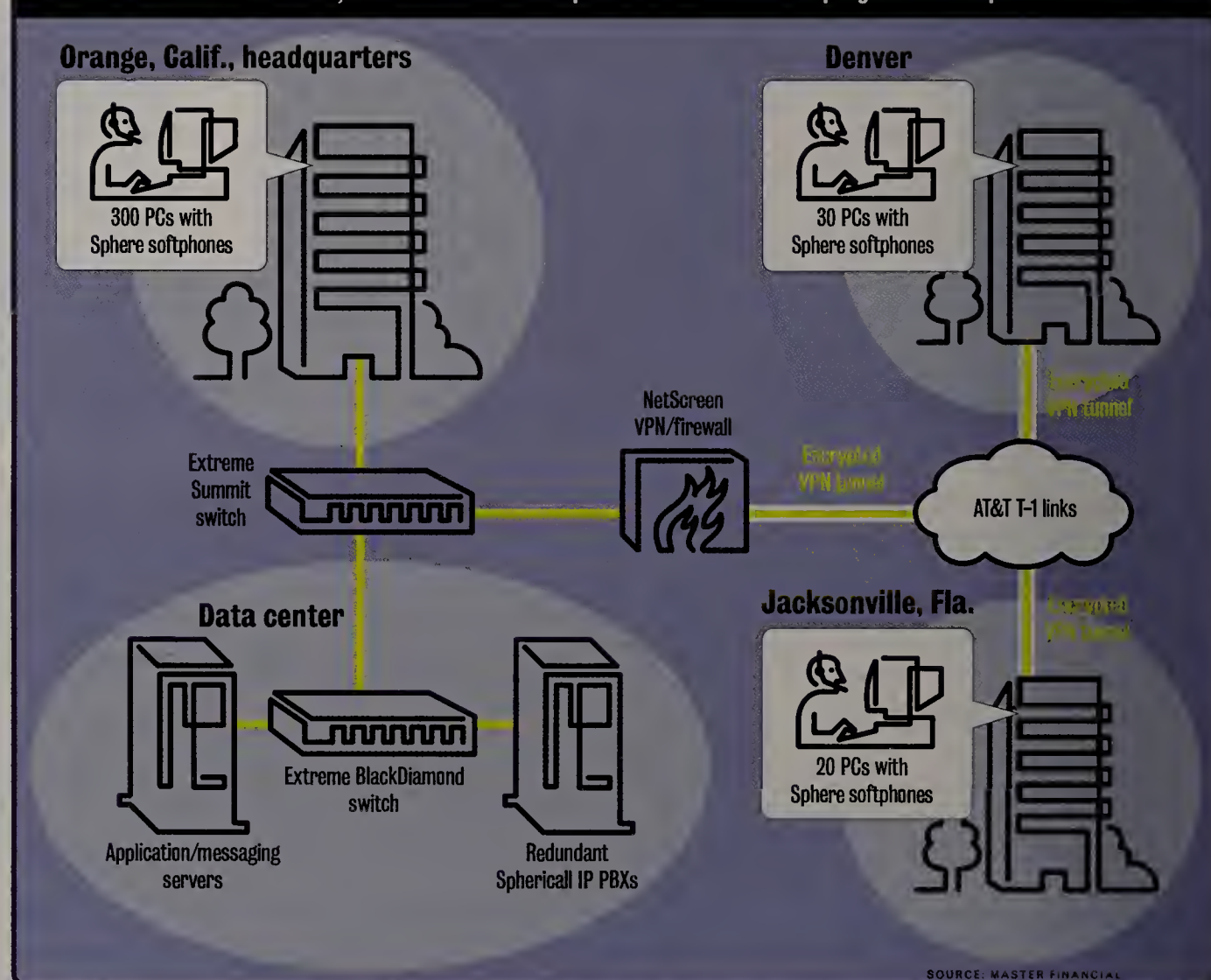
Plus, by integrating the IP telephony software with a custom-developed loan-processing application, Master Financial has let call agents access customer data and handle loan processing more quickly. Mullins says the firm has cut the number of days it takes to process a loan by 10 on average and increased the number of loans handled monthly by 40%.

2. Long-distance is cheap, but VoIP is even cheaper.

One eye-opening moment for Mullins was when the company went through its first month on the Sphere system without getting a pile of telecom bills from the three carriers it once used. "The per-minute rates for

Softphones for all

With its recent move to VoIP, Master Financial now provisions voice service to employees at headquarters and two remote offices from a central location. Two redundant IP PBXs reside in the firm's data center, and PC-based softphones are on all employee desktops.



long-distance is cheap. But they get you on the taxes, access fees and line charges," Mullins says. Now, with all voice collapsed into one data center, Master Financial has only one carrier. "We ended up saving about \$30,000 to \$40,000 per month on local and long-distance charges," he says.

3. IT control is key.

To keep its converged network running smoothly, Master Financial has standardized on hardware and software and strictly controls what users can do with their machines.

The firm uses Dell PCs and servers, which gives Mullins one source for support. Because the PCs on each desktop also are an employee's only telephony tool, maintaining the machines' stability is paramount, Mullins says.

"Keeping everything the same is a challenge, but it's worth it," he adds.

Master Financial uses software to block users from adding unapproved applications to their PCs. It distributes updates for the homegrown loan-processing software or the IP softphone clients through automated downloads. ■

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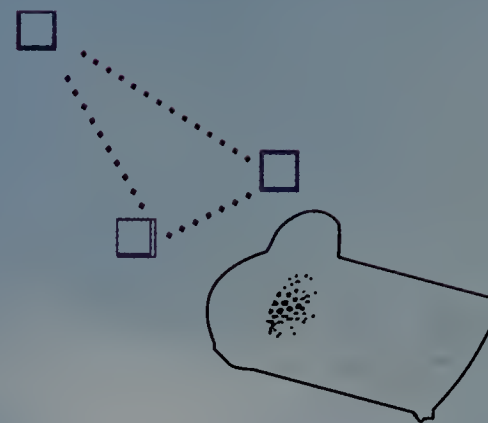
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Sold

on the new data center concept

Burlington Coat Factory is investing its IT future on a grid-based, virtualized architecture.

■ BY BETH SCHULTZ

Burlington Coat Factory CIO Mike Prince has ridden many a technology wave in his 21 years with the company. But none has inspired the awe he feels about the new data center. Automated provisioning, grid computing, high-speed system interconnection, open source systems, virtualization: "This approach is so rich and feature-full, it's overwhelming to think of how we're going to exploit it all," he says.

But exploit it, Burlington Coat Factory will.

Never one to shy away from a challenge, Prince is piecing together the latest data center technologies to create a sophisticated on-demand architecture with extreme economy — processing power that previously would have cost \$1 million will cost only \$100,000, he says. To do so, Prince is picking technologies from industry stalwarts and start-ups alike.

"We didn't have to read the tea leaves to know the best technology out there for a new architecture," Prince says. Call it grid, as does Oracle, or on-demand, like IBM, he adds, "I absolutely believe in the basic concept of binding together slower systems by hardware and networking so they can be used in parallel to provide computing resources and in so doing creating a highly scalable and reliable environment."

Burlington Coat Factory is not just changing out the operating system, database and systems hardware used in the data center, it's undertaking this tri-level migration simultaneously. Under the new data center architecture, out goes the Dynix/ptx Unix variant and Oracle 8i database on IBM Sequent servers; in comes SuSE Linux (Novell) and Oracle 9i and 10g on Intel-based IBM xSeries machines. Topping off this infrastructure mix are new data center products such as Cloverleaf Communications' disk virtualization technology, PolyServe's file management systems for clusters, Topspin Communications' InfiniBand-based server switches with server virtualization software, and Vieo's application infrastructure management appliance.

These new data center plans mushroomed once Burlington Coat Factory learned in 2001 that IBM was closing down the Dynix/ptx line, and that Oracle was backing off support. First, the company quickly settled on SuSE Linux as its new operating system. But because Burlington Coat Factory could neither run Linux nor the latest Oracle databases on its old hardware, nor put its old database on the new platform, hardware and database change-out became equally imperative. The only sensible choices were IBM's Intel-based xSeries servers and Oracle databases running over Linux, Prince says.

Even with the other changes, the operating system decision was easy, given the company's familiarity with, and advocacy of, Linux. Burlington Coat Factory has used Linux for its point-of-sale and backroom retail operations since 1999. "We know it. We like it. We believe in it," Prince says of the open source code already deployed on

See Burlington Coat Factory, page S20

Burlington Coat Factory CIO Mike Prince is wowed by the possibilities that new data center technologies afford him.

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Burlington Coat Factory

continued from page S18

about 7,000 POS systems and small computers.

Burlington Coat Factory began casually investigating Linux in the data center in 2002 and started a serious migration attempt in early 2003. But that effort lost full steam by August 2003, when developers realized "too many pieces of the stack weren't ready," Prince says. The IT staff said a Linux-based data center couldn't quite handle the company's high-season needs. At the time, SuSE Linux couldn't capably handle the company's disk access requirements. The operating system could perform hundreds of logical unit number (LUN) lookups, but Burlington Coat Factory needed to do thousands. Plus, the Cloverleaf disk virtualization technology wasn't ready to move out of beta-test mode, adds Prince, noting that the retailer made it through last year's holiday shopping madness with the help of loaned Sequent gear from IBM.

Prince foresees no such problems this year. The technology has matured to the point that by Labor Day, the \$2.7 billion Burlington, N.J., retailer expects to have its eight most important databases — those used for merchandising information — running in an Oracle 9i- or 10g-based grid, he says. "The hardware is in place, the storage provisioned, and everything looks extremely good in testing and benchmarking," he says.

He notes, too, that because Burlington Coat Factory is changing out its operating system, hardware and databases all at once, it has taken an ultra-rigorous approach to integration and testing. "We've been pushing our project management and quality assurance to their limits," Prince says.

For example, developers have been "waling" on a full-blown replica of the men's outerwear database — one of the eight merchandising databases — "and it's looking very good in terms of performance," Prince says.

The company can tap into available computing resources as needed from any number of the distributed systems tied together in the Oracle 10g grid. If Oracle 10g continues proving successful in test mode, then Burlington Coat Factory likely will skip over Oracle 9i for this men's outerwear and other critical merchandising databases and move right into the 10g-based grid.

Still, Burlington Coat Factory continues putting Oracle 9i through its paces, both in test and production scenarios. For example, a stored-value-card application, which keeps track of the value owed to customers for gift cards and cards issued for store credits, is powered by an Oracle 9i Real Application Cluster (RAC) in the new data center. Oracle's 9i RAC lets users run databases across multiple servers, providing load balancing, fail-over support and scalability.

No matter whether 9i- or 10g-based, Burlington Coat Factory's new database and application server clusters will use InfiniBand for high-speed interconnection. With InfiniBand, the company will net even greater performance improvements than it can achieve by moving off the old large-scale Unix systems alone. "We hope to double our Oracle application performance," says John Decatur, a systems specialist with Burlington Coat Factory.

Using Topspin's InfiniBand-based server

switches in test mode, the company has interconnected the clustered xSeries database and application servers, the enterprise LAN servers and the Fibre Channel storage-area network over a 10G-bit/sec fabric (see graphic, below), Decatur says. "With Topspin, we can bring the network and the storage right to the switch, which makes for a much simpler model" than the conventional network architecture that requires a separate interface for each system interconnected, he says.

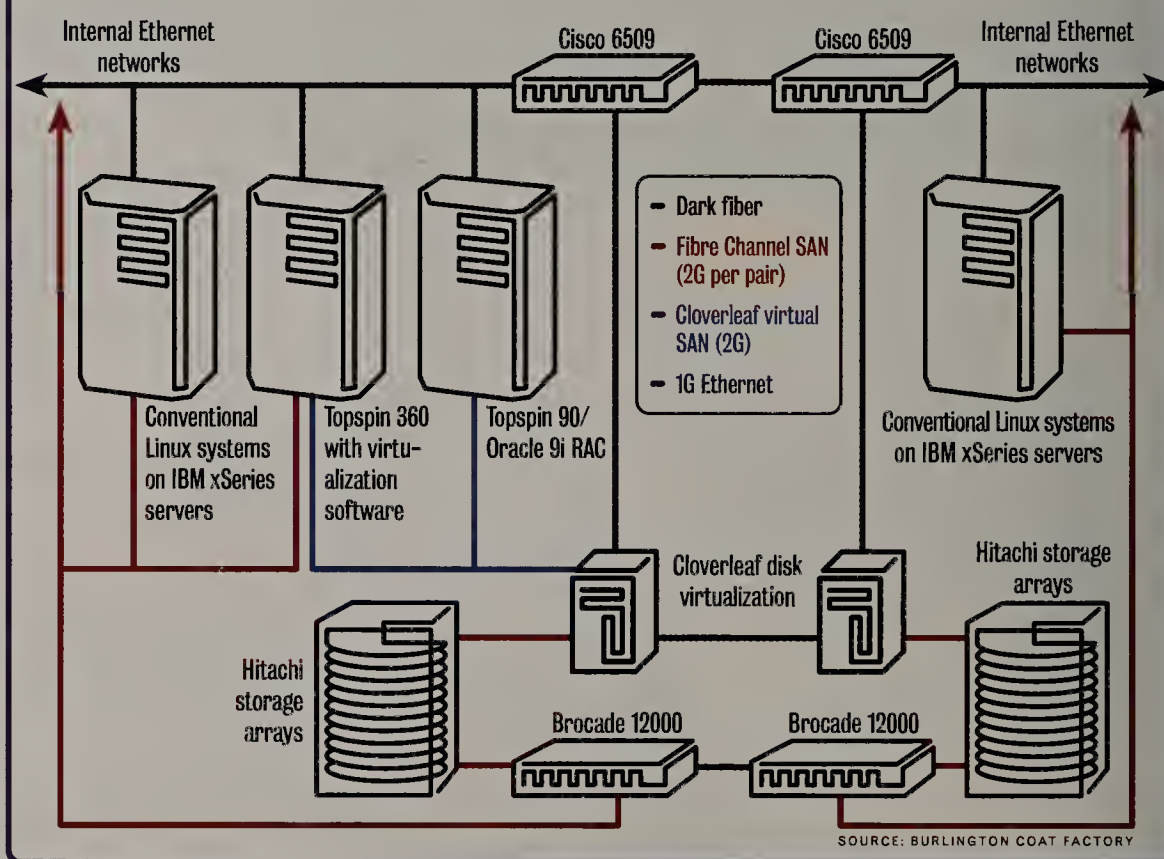
With Topspin's new VFrame server virtualization software, Burlington Coat Factory can program the server switches with policies it needs to create virtual servers out of shared computing, storage and network resources. The company has tested the InfiniBand capabilities of

And the overlap doesn't stop there. Burlington Coat Factory can use Oracle for some storage provisioning and also plans to test Vieo's application infrastructure management appliance for its ability to command provisioning should service levels fall below expectations. Then in the storage layer, there's the PolyServe software the company plans to use for provisioning a clustered file system on the clustered servers.

"The most difficult thing, having grappled with this for a year, is that we have several good choices on how to play this... We see a tremendous amount of synergy and the potential to automate the data center like never before.... But we're looking at five or six vendors in the stack — that's a lot," Prince says, especially because these aren't just vendors providing

A stylin' new data center

Nationwide retail chain Burlington Coat Factory has pieced together a new data center architecture using standards-based systems and open source software, plus the latest in virtualization products.



the Topspin products for about six months, but only recently began trying out the VFrame capabilities, Decatur says.

However, the VFrame virtualization software brings out one of the biggest challenges developers have found in architecting for the new data center — that being, trying to figure out what vendor to choose for which function, Prince says. For example, Burlington Coat Factory has been testing — and liking — Cloverleaf's disk virtualization technology for provisioning storage resources (at 60T bytes today and climbing rapidly, Decatur says). But VFrame, although primarily for server virtualization, provides some functionality for virtualizing storage, too.

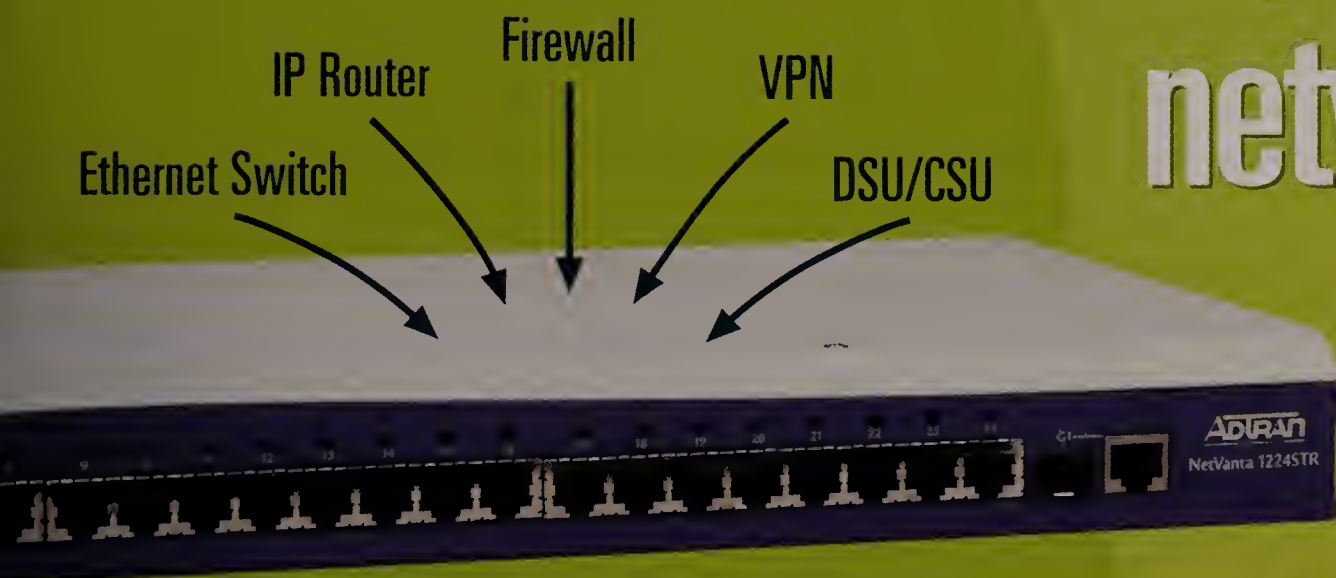
"Topspin is providing InfiniBand resources for core networking and storage. But it also provides the capability to provision servers, pulling together not just the binaries for the operating system and starting them up but also providing the correct network identity and visibility into storage-area networks," he says. "And the LUNs that all these servers see? They are virtual LUNs being created by Cloverleaf."

nice-to-have features but major functions of the new data center architecture. The good news is that no matter the choice of vendor — or combination of vendors — deploying server and storage virtualization will increase computing power and performance, he adds.

More efficient use of computing resources also will let Burlington Coat Factory undertake resource-intensive analysis projects it previously shied away from because processing requirements were too high, Prince says. With reliability of the new architecture expected at near 100%, the company should be able to let applications run at the retail outlets pull information out of centralized databases. Previously, Burlington Coat Factory did not support such interactivity between the stores and the data center. Prince explains: "We didn't want an operation at a cash register interrupted by a computer disruption at the data center."

But Burlington Coat Factory certainly is proving that change is good. As Prince says, "We have painstakingly proven that [the new data center] approach works. This is not vaporous." ■

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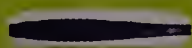
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Wired over server virtualization

HP, IBM, Sun and VMware are charging up their server lines with virtualization. Understanding how each approach would work in your new data center is no easy task.

■ BY MARY BRANDEL

Server virtualization is an action item on nearly every IT agenda these days. Gartner predicts that by the end of next year, 25% of the Fortune 1000 will use partitioning — a key virtualization technology — for their Windows server deployments. And by 2008, the firm estimates, companies that don't leverage virtualization technologies will spend 25% more for their Intel servers and 15% more for RISC servers, including hardware, software, labor and space.

Still, users might have a hard time drawing a bead on the various server virtualization architectures — what the strategies are, which are best for their environment, which will accommodate virtualization needs for storage and network resources, and how much the architectures lock them into the vendors' products.

Part of the problem is, server virtualization is a moving target. "A lot of things are considered virtualization," including partitioning, workload management, server provisioning and server automation, says Jamie Gruener, a senior analyst at The Yankee Group. "If there's a nail, virtualization is [the vendors'] hammer."

Most IT experts agree on the definition of server virtualization, but vendors offer varying ways of achieving that goal. "The idea is to present the illusion of one huge machine that's infinitely powerful, reliable, robust and manageable — whether it's one machine that looks like many, or multiple machines tied together to look like a single system," says Daniel Kusnetzky, a vice president with IDC.

The best users can do is ask questions (see "What to ask" at www.nwfusion.com, DocFinder: 2523). "They have to take a look at what servers are in their environment, how they manage them as a group, what they could do to reduce their amount of management time and ask vendors how they can use their platform in a heterogeneous fashion," Gruener says.

Laying the groundwork for those questions, *Network World* recently spoke with the top server vendors, and VMware (an EMC company) with its pervasive solution for x86-based machines, about their virtualization architectures. Here's a look at how HP, IBM, Sun and EMC/VMware define virtualization and at how their products fulfill that definition.



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Virtualization defined: When you talk about server virtualization with HP, the conversation tends to drift into the company's overall virtualization vision, which it calls Adaptive Enterprise. Adaptive Enterprise is an approach to IT that pools resources and optimizes resource utilization, enabling supply to automatically meet demand. By integrating server virtualization with HP's storage, network and application virtualization solutions, as well as its design, implementation and management services, users should be able to build a complete IT utility architecture, HP says.

HP says businesses will achieve three times their current utilization rate using server virtualization.

The story begins with HP-UX

HP's strongest platform for server virtualization is HP-UX, which runs on its 9000 and Integrity servers. (Integrity servers also run Windows 2003 Datacenter Edition and Linux, with OpenVMS planned for the future.)

The HP-UX platform lets users create virtual partitions (vPAR), on 9000 and Integrity servers, meaning that separate operating system instances can coexist on the same system, with operating system, application and resource isolation. Users also can dynamically move CPU power among vPARs as workload requirements change.

In the past, workloads could only be shifted within servers or between identical boxes. Now, workloads can jump from a 9000-series server to a partition in an Integrity Superdome. Using VMware's VMotion, applications can be moved from a x86 box to a partition on an Integrity server.

Things get more interesting with HP's Virtual Server Environment, powered by HP-UX Workload Manager (WLM), a resource management tool that orchestrates virtual server resources. Users can set service-level objectives, and WLM automatically grows and shrinks CPU resource allocation based on those objectives and its own real-time assessment of resource usage.

"It's no longer, 'I need a two-CPU server partition for my Oracle database,'" says Nick van der Zweep, HP's director of virtualization and utility computing. "Instead, I tell the system, 'I want sub-second response time with the Oracle database,' and it will start at one CPU and automatically move you to two, four, eight, 16, 32 and back down as your needs ebb and flow."

HP-UX WLM is integrated with HP's server virtualization offerings, such as resource management groups, partitions, clustering and instant capacity-on-demand (iCOD). The system can deactivate and activate processors on physical partitions or HP-UX servers, moving resources to where they are most needed. Users pay only for actual processor usage. HP-UX WLM is integrated with hardware management tool HP Systems Insight Manager, available with HP OpenView.

Meanwhile, on x86

In the Windows/Linux/x86 world, VMware is

HP's claim to virtualization fame, both on its ProLiant Blade family and stand-alone systems. It also plans to support the upcoming Microsoft Virtual Server. WLM is not available for these platforms, but HP plans to release a version of WLM later this year that supports multiple operating systems and hardware.

In the blade world, the key to virtualization is the ability to do rapid provisioning, according to van der Zweep. With its ProLiant Essential Rapid Deployment Pack, which dynamically allocates system resources on multiple Windows 2000 servers, reprovisioning an eight-blade system can take from 10 to 40 minutes.

HP also offers iCOD software on its ProLiant blade servers, so that as customers use a

blade, they automatically are invoiced for that blade and a percentage of the infrastructure.

WLM is available only for HP-UX, but HP intends to release Global Workload Manager (gWLM) this year to extend workload management to heterogeneous systems. Its first release will support Linux running on HP 9000 and HP Integrity servers. Later releases will support ProLiant servers. Eventually, gWLM would let users view all HP systems as one server pool. Based on service-level objectives, applications will be assigned to a resource domain, and if they begin competing for resources, gWLM will arbitrate resource allocation. GWLM will integrate tightly with HP Systems Insight Manager.

Analyst view:

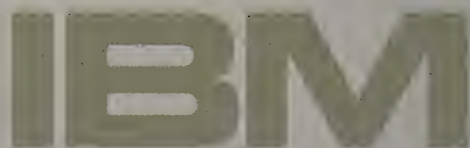
"HP currently offers the most comprehensive data center-level virtualization solution with Utility Data Center," says Tom Kucharvy, a Summit Strategies analyst. He sees UDC, part of the Adaptive Enterprise, as the first commercially available, fully configured utility platform to aggregate and virtualize server, network and storage resources. Limitations of UDC include the need for custom adapters, the difficulty of initial configuration and its relative homogeneity.

Meanwhile, Mark Ehr, research director at Enterprise Management Associates, points out HP's lack of an orchestration component that coordinates all the functions required for a virtualization strategy. These include provisioning, security, policy and elemental automation. Compared with IBM, he says, HP has less experience with and less investment in virtualization. However, compared by cost, Ehr says HP's products might be more attractive to midsize companies than IBM's are.

User view:

Pittsburgh Public Schools (PPS) wanted to create 40,000 virtual environments for students and teachers. CTO Elbie Yaworsky wanted an environment that had no physical, virtual or logical limitations; was highly redundant; was operating-system-agnostic; blended blade servers and multiprocessors; and dynamically allocated all available resources. He also wanted to use storage-area networks and network-attached storage.

PPS chose HP to build an environment that includes 122 HP ProLiant blade servers as front-end servers for Web access and 22 HP ProLiant servers to host five mission-critical applications. The remaining applications run on 23 HP ProLiant DL380 servers. The storage system consists of a 6T-byte HP StorageWorks EVA Storage Array, two HP StorageWorks NAS e7000 storage drives, two HP StorageWorks tape libraries and 14 racks. PPS will use either Linux- or Windows-based applications and already has seen during testing that it quickly can switch between the two operating systems.



Virtualization defined: When it comes to virtualization, IBM talks big, and with last month's introduction of the Virtualization Engine — which will bring mainframe-level virtualization to its i, p and x series computers — it's putting some walk into that talk.

Similar to its competitors, IBM doesn't like to talk just about server virtualization. "If I don't have the ability to virtualize the storage, networking and applications, then I've defeated the purpose of having virtualization," says Tim Dougherty, director of IBM eServer products. That's the basis for IBM's On Demand strategy. The company also says it will include support for competitive systems in its ongoing development of technology and services for flexibly managing pools of server resources.

To IBM, virtualization means detaching physical resources from logical resources to increase utilization of current assets and move workloads around at will through provisioning and workload management.

Drawing on Big Iron

IBM has been achieving 80%-plus utilization on its mainframes — now its z series — for years by taking one processor and chopping it into many partitions or systems, each running its own instance of the operating system. With the introduction of its Virtualization Engine product suite, it is now bringing those and other capabilities to its iSeries (AS/400) and, later, to its p (IBM AIX Unix platform) and x series (x86-based) machines.

Virtualization Engine comprises technology and services. The technology part — which will be available on the p and i series — focuses on CPU partitioning. So while AIX's dynamic logical partitioning let an eight-processor machine run eight instances of the operating system, and move workloads among processors, Virtualization Engine will do micro-partitioning, turning one CPU into 10 virtual servers. "Now a four-processor machine can run as many as 40 different machines," Dougherty says. "So you may have had 50% utilization before, while now you'd get 30% to 40% more." Virtualization Engine technologies will appear first in IBM's new iSeries servers expected in the second quarter.

Like HP, IBM also offers the ability to add capacity quickly, based on need, on select IBM





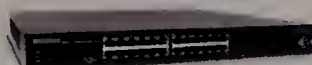
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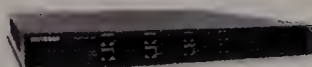
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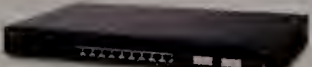


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pSeries systems. However, unlike HP's iCOD, it cannot subtract the resources once the peak in demand subsides. Combined with the logical partitioning of AIX, Capacity Upgrade on Demand (CUoD) gives you reserve processing power to meet new user demands without disrupting current operations.

Up from the xSeries

The services portion of Virtualization Engine hails from IBM Director, a systems management tool targeted at IBM's xSeries and BladeCenter machines. In its new incarnation — IBM Director Multiplatform — it will be a single point of control and management for all four of IBM's system platforms, and non-IBM systems, grids and clusters.

Virtualization Engine also will include enterprise workload management and provisioning capabilities from IBM's Tivoli division, so that you can optimize application processing across all your computing assets, based on business policy. "The idea is that you don't just want to include IBM systems but that there are other vendors' systems in the complex that you want to manage and provision," Dougherty says.

IBM also will provide a grid toolbox based on Open Grid Services Architecture and its WebSphere technology. This also will let applications

run in grid-computing fashion across all four of its platforms.

All this will be rolled out over time. For now, IBM

depends on its close relationship with VMware and its current IBM Director product to virtualize its xSeries machines.

Analyst view:

"IBM has a strong library of virtualization technologies on which to draw, going back to its mainframe days," says Gordon Haff, an analyst at Illuminata.

Enterprise Management Associates' Ehr concurs. "IBM has the strongest virtualization strategy for a couple of reasons: It has been doing it for quite some time in partnership with VMware, and it has been working pretty hard with the standards bodies to make sure that the emerging virtualization standards work with its hardware, and vice versa," he says. Ehr also points to IBM's shipping "orchestrator," or automator-of-automators. Of course, expense, as it will be for any full-blown virtualization implementation, is a drawback.

User view:

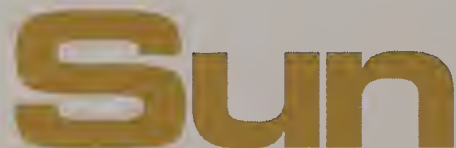
When Alpine Electronics, a mobile electronics supplier in San Jose, needed to sim-

plify its IT infrastructure to support its fast-growing business, it decided to replace its four HP servers running Oracle ERP applications with one IBM p670 Unix server running SAP. An additional three entry-class p630 servers will host Alpine's e-commerce transactions and enterprise testing environments.

The p670 was chosen for its ability to perform multiple tasks in a logically partitioned environment, according to Vasile Giulea, IS manager at Alpine. The p670 can be divided into as many as 16 virtual servers, running any combination of AIX and Linux, letting multiple applications share one server.

Alpine also takes advantage of IBM's CUoD to access additional memory and CPU power for month-end ERP efforts.

Giulea says he expects to realize a 20% annual reduction in maintenance costs per year through server reliability, consolidation and logical partitioning capabilities.



Virtualization defined: Get used to the word "grid" if you want to understand Sun's approach to server virtualization, which is just one component of the company's N1 Grid strategy. N1 Grid — which refers to "managing 'n' computers as '1'" — is Sun's vision for optimizing network computing. Within that grand plan, the N1 Grid System includes all the core services for establishing, partitioning, provisioning and managing grids in accordance with business policies. It also enables data center virtualization, including storage, servers and software.

Scaling up

Sun lets users "scale up" or "scale out" server resources, although its future intention is to manage both environments under one umbrella.

For users who prefer to pool server resources onto one large system, Sun has long offered hardware partitioning through its dynamic system domains and a rudimentary level of software partitioning through the Solaris 9 operating system. By early next year, it plans on offering logical partitioning through N1 Grid Containers on Solaris 10.

With N1 Grid Containers, users will be able to create multiple software partitions on one instance of Solaris 10. They will be able to create up to 4,000 fault-isolated software partitions (or "containers"), each with its own IP address, memory space, file area, host name and root password. The system will dynamically adjust resources to business goals within and across the partitions. And because the containers are separate from the hardware, they easily can be moved onto other systems.

The technology will be available for all Sun

server platforms, including UltraSPARC- and x86-based systems and Sun's mixed-architecture (x86 and SPARC) Sun Fire Blade.

Scaling out

With a "scale up" strategy, you make a shared resource look distributed; with "scale-out," you make distributed resources look shared.

To accomplish this, you have to go beyond the operating system, says Shahin Khan, vice president of high-performance technical computing at Sun. "If I have 24 boxes, I want to throw a single software blanket on top so they all look like one box," he says. "The applications now only see the blanket, and the blanket sees the underlying hardware." The only problem is, today the blanket is more like a quilt with some patches missing.

Which brings us back to Sun's still-developing N1 Grid initiative, which is coming together with the help of Sun's recent acquisitions of CenterRun, Terraspring and Gridware. The pieces of the N1 Grid system that enable server virtualization include the following:

- N1 Grid Console, which is the consolidated

point of management for all servers in the grid.

- N1 Grid Service Provisioning System 4.1 (made possible through the CenterRun acquisition), which provisions applications across servers, using an optimization engine to balance workloads. It also does automatic server installation, configuration and updating. It runs on Solaris SPARC and Solaris x86, Linux and Windows machines and can manage Solaris, Linux, AIX and Windows servers.

- N1 Grid Engine software (made possible through the Gridware acquisition), which aggregates available computing resources and delivers them as a network service, enabling five to 10 times the usable power of servers on the network.

- The N1 Data Platform, which virtualizes the storage capacity of multiple arrays.

- N1 Grid Provisioning Server 3.1 Blades Edition (made possible through the Terraspring acquisition), which is a management environment for the Sun Fire Blade Platform. It lets users design, configure, provision and scale blade-based server farms automatically as one pool of virtualized resources.

Analyst view:

"Sun has scaled back its grander N1 ambitions and is focusing its cross-system virtualization and provisioning efforts around its CenterRun acquisition," Illuminata's Haff says. "At the single-system level, Solaris 10's N1 Grid Containers could help plug a hole left by Sun's prior reliance solely on physical partitioning techniques."

Other analysts, such as Enterprise Management Associates' Ehr, fault Sun on its lack of a heterogeneous solution.

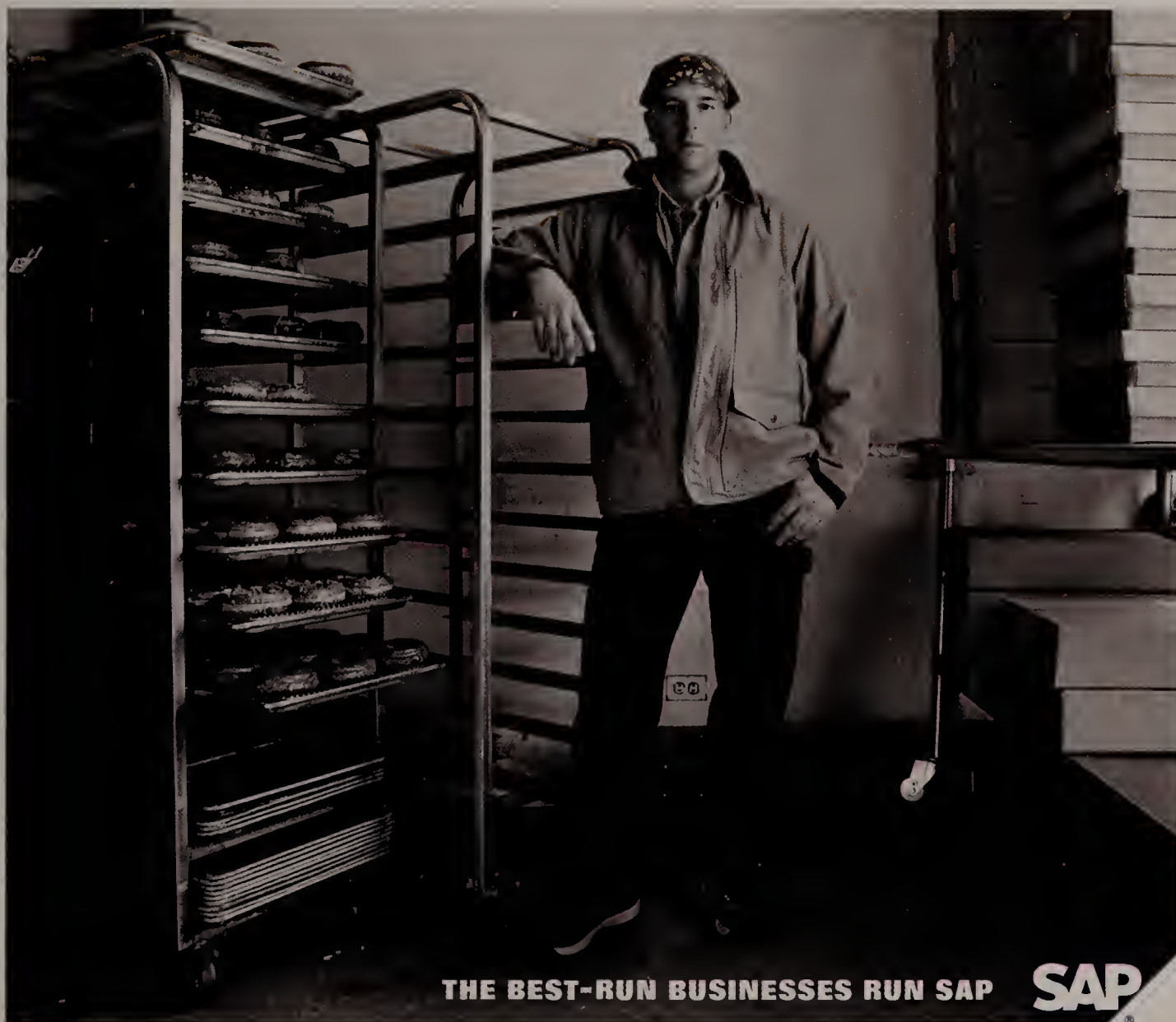
User view:

A major North American financial services

provider with more than 34,000 employees, which asked not to be named, uses N1 Grid Engine software to compute investment portfolio data. The main grid runs with the Sun Fire 4800 server and the Sun Fire V880 server as a grid cluster, and a Sun StorEdge 3910 stores the data.

Investment portfolio data is gathered into the system at night, and then simulations and other relevant computations are run, are parallelized for the grid. Results are amalgamated and prepared for reports by 9 a.m. the next business day. The company says it has reduced IT costs and improved its return on assets.

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VMware

Virtualization defined: VMware approaches virtualization quite differently from the traditional systems vendors. Rather than building partitioning into the operating system — as HP and IBM have done with HP-UX and AIX — VMware inserts a virtual hardware layer between the operating system and the actual hardware, which serves as an intermediary between the operating system and the physical hardware. This ultimately makes the resulting “virtual machines” portable because the operating system depends on the virtual hardware layer, not the physical hardware.

“There’s no dependency between the [operating system] and the underlying hardware, so you can take a virtual machine from one system — like IBM running on a RAID array — to a Dell running on a [storage-area network]. The [operating system] is taking the virtual hardware with it,” says Michael Mullany, vice president of marketing at VMware.

Anything that runs on x86-based systems can run VMware, including all versions of Windows, Linux and NetWare.

Now that EMC owns VMware, the company is

stretching beyond server virtualization to the Virtual Infrastructure, which includes storage and networking.

ESX Server

VMware’s ESX Server can be implemented directly on any x86-based platform, running a maximum of a two-processor environment. Mullany says it will support larger environments in the future; last June, it ran only a single-processor environment.

Users can manage pools of ESX Servers via VirtualCenter, VMware’s virtual infrastructure management software, which lets administrators shift around resources to minimize unused capacity and quickly provision servers.

Many VMware users administer ESX Server for disaster recovery, testing/development and data center consolidation. In a testing environment, for instance, you can capture the operating system and accompanying application software in a file and copy it to another system, “eliminating four to six hours of rebuilding servers for a new test case,” Mullany says.

Because VMware is the only way of creating virtual

partitions on x86-based servers — outside of Microsoft’s own Virtual Server and eventual Longhorn operating system — the company has developed close relationships with many server vendors, including Dell, HP, IBM and NEC.

Distributed virtualization

As part of its VirtualCenter, VMware also has developed a “distributed virtualization” system — called VMotion — that migrates a running virtual machine to a different physical server without service interruption. “What this allows you to do is almost immediately rebalance how workloads are consuming system resources across a pool of hardware,” Mullany says. “If you have a couple of [operating systems] on one server, you can just move one of them to a second server without dropping users.”

This will come in handy for doing system maintenance procedures. Because you can move users off servers without affecting their processing, you can add memory or do hardware fixes without planned hardware downtime. Users also can use VMotion for load balancing on the fly.

Brandel is a freelance writer in Michigan. She can be reached at mary.brandel@comcast.net.

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Analyst view:

“The only place where the hardware platform dependency has been overcome is with VMware,” Yankee’s Gruener says.

“What VMware gives you is a total separation of partitions,” Enterprise Management Associates’ Ehr adds. “If something goes crazy in Partition A and causes a crash, it’s not going to bring the operating system down.” Microsoft is heading in that direction with Virtual Server 2003, “but we think it needs to be making more changes to the core operating system, which will happen in Longhorn,” he says.

User view:

Gannett Media Technologies International (GMTI) just completed a new Web hosting infrastructure to provide on-demand IT services to its clients, according to Chris Ruffieux, vice president of technology at the Cincinnati company. Using ESX Server, GMTI runs 40 virtual machines on four Dell PowerEdge 6650 servers running Windows and Linux. The servers are connected to a 30T byte EMC storage-area network. GMTI is also using VirtualCenter and VMotion.

The benefits, according to Ruffieux, are threefold:


- Economic. It lets the company reduce its physical server count while isolating certain functions to certain virtual servers.
- Ability to scale out. This is one of the most important benefits, Ruffieux says. “We’ve always believed in physically decomposing IT functions as opposed to putting lots of services on one machine. VMware allows us to practice this approach without the associated cost of managing and purchasing additional services,” he says.
- Reliability. VirtualCenter and VMotion let Ruffieux manage and manipulate machines without having to take down the machines.



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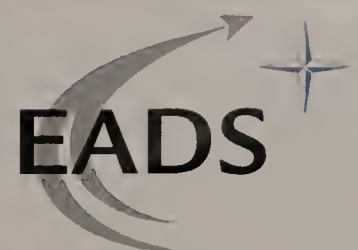
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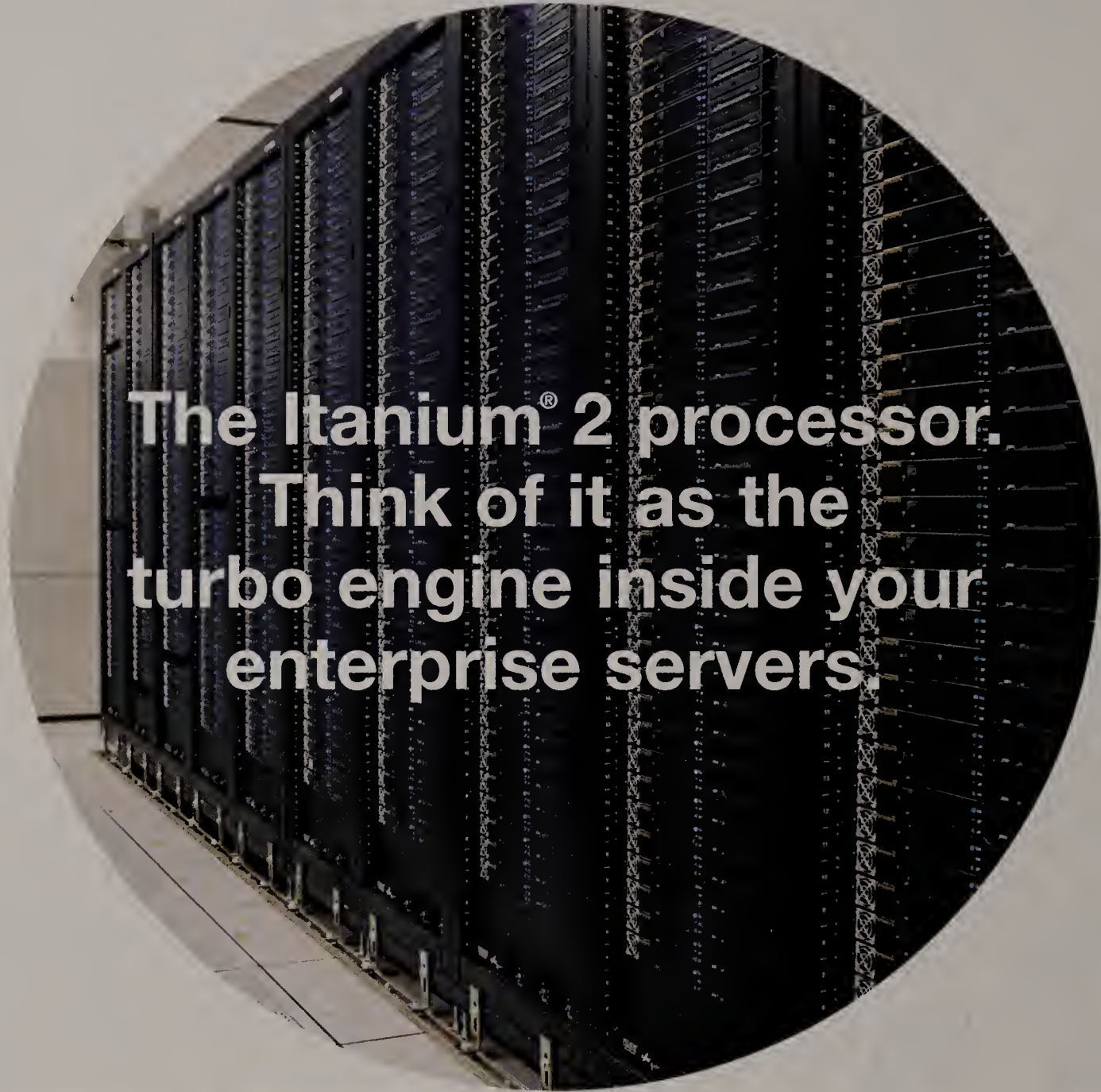
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Net.Worker

■ PRODUCTS, SERVICES AND STRATEGIES
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Q & A Divining the future of work



Charlie Grantham and Jim Ware

As the world economy begins recovering from nearly five years of stagnation, businesses developed from an industrial mindset face obsolescence. The future will see dramatic change in how, where and with whom we work. Net.Worker Managing Editor Toni Kistner spent time recently with Charlie Grantham and Jim Ware, leaders in what's loosely called the "future of work

movement." The team runs a consulting firm that helps companies including Capital One, PeopleSoft, Intel and Cisco develop programs that ease their transition to the future. They also founded the Future of Work, a global network committed to building work environments that are cost-effective, socially and environmentally responsible and personally satisfying.

What are the key forces changing the way we work?

Ware: Demographics, economics and technology. The workforce in industrialized countries is growing older and more diverse, with many more women and minorities. We're seeing earlier entry of single moms and lower-skilled workers, and far more people working into their mid-70s — both because their health allows it and they can't live on a small retirement annuity based on a life expectancy of 65.

The economics of work are changing, too. You used to beat the competition by making more and more stuff, cheaper and cheaper. But today and increasingly in

the future, people are willing to pay a premium for customizable products that meet individual needs. The hottest job growth will occur in the creative class — teachers, healthcare professionals, designers (from software to clothing), financial analysts.

Yet, despite current thinking, we're suffering from a talent shortage that'll only worsen in the next five years. There are whole lot more knowledge-based jobs than qualified people to fill them. A recent Harvard Management Update cites a Bureau of Labor Statistics report that predicts that by 2010 there could be as many as 10 million more jobs available in the U.S. than employees to fill them. Why aren't human resources managers tearing out their hair?

And, of course, technology has finally made remote and mobile work as efficient as being in the office next door. While there's no substitute for face-to-face interaction when teams start a project, midway through, and at the end, the rest of the time, there's just no need to drive to the office.

What else is changing?

Grantham: The rules of engagement. Creative talent now controls how the game is played — we see it in the entertainment industry, financial services, medicine, education, and certainly in professional sports. The stars name the terms and let their agents negotiate the employment contract. This system for matching talent and work will soon migrate into engineering and even liberal arts professions. If you need a degree to do a job, there will be more work than you can shake a stick at, and you — the professional — will define the terms.

There's also a renaissance brewing in how humans organize to produce things, ideas and services. People are moving back to smaller groups, teams and micro-businesses. The only thing keeping people on big-company payrolls is health

See Future, page 72

Short Takes

■ **Netgear** has introduced unmanaged Gigabit Ethernet switches for consumer home networks and small businesses. Stackable and fanless, the **GS605 five-port** and **GS608 eight-port** switches provide a maximum data throughput capacity of 2G bit/sec per port and are suited to consumer applications such as high-end multimedia, large file transfers and gaming. The GS116 16-port desktop switch and rack-mountable JGS516 16-port and JGS524 24-port models are suited to small offices and departmental workgroups. They offer 2G bit/sec full-duplex throughput speed per port and up to 48G bit/sec backplane bandwidth. Available this month, the consumer switches cost \$96 and \$157. The small business desktop 16-port switch costs \$460; the 16- and 24-port

rack-mountable switches cost \$490 and \$700, respectively.

■ **DSL Forum** reports there are 73.4 million DSL subscribers worldwide. In North America, DSL subscribers increased 11.7% in the first quarter of 2004. In the U.S., there are 10.58 million DSL subscribers, and DSL penetrates 5.6% of phone lines.

■ **Worldwide Telco** recently launched **Worldwide IP Phone**, or **wIP-phone**, a telephony service for home and small business customers. The wIPphone family of products include the X-Pro Softphone for PC calling; a device for converting an analog phone into an IP phone; a stand-alone IP phone that includes a router and WAN port, and IP telephony devices that connect to the network and don't require a PC. Customizable rate plans are available, calling plan rates vary, and the softphone is available for download with 30 free minutes.

TiVo connects to PC, 'Net

■ BY JORIS EVERS

In a move aimed at establishing its digital video recorder as the entertainment hub of the home, TiVo announced that home network features now will come standard with its devices.

TiVo also plans to let subscribers download movies and music from the Internet to its devices. No date has been set.

Until now, TiVo's home network features were available only with the additional purchase of the TiVo Home Media Option for \$99. The option lets TiVo subscribers use TVs to view photos and home stereos to play music stored on a computer by connecting a TiVo device to a home network. Now the features are a standard part of the \$12.95-per-month TiVo subscription fee.

The TiVo home network feature works on wireless and wired home networks by connecting a network adapter to the USB port on a TiVo Series2 device. To encourage existing customers to buy additional digital video recorders, TiVo has cut the subscription price on a single account to \$6.95 per

box, per month (for up to five boxes), and announced multi-room viewing capability, which lets users transfer shows recorded on one TiVo box to another.

TiVo's plan fits with a push by many vendors to make digital content stored on a PC and available on the Internet accessible on traditional consumer electronics devices. Sony and Philips have announced similar products, where a TV and stereo form the home entertainment hub.

Traditional PC vendors want to make the PC the center of the home entertainment network. Later this year, Microsoft and hardware partners Dell and Gateway will introduce Windows Media Center Extender devices that wirelessly link computers running Windows XP Media Center Edition to televisions. Windows Media Center extender will let users access photos, videos and Internet services on a TV using remote control without physically connecting a TV to the PC or having it in the same room.

Evers is a correspondent for the IDG News Service's San Francisco bureau.

TELEWORKER
BEATToni
Kistner

When you can't work from home, Part 6

wanted to get into publishing, but to make sure his agent sent his scripts out to all the right people, he took matters into his own hands. Three years ago Horvat sold the business and began reviving his "moribund writing career." Yet, he did the same thing all over again; he built a business based on his own business need.

This time, Horvat needed the right environment to work. "I couldn't work at home, I needed somewhere where there's humanity, body heat, the vibe you want to pick up." Horvat began researching, and discovered plenty of people looking for more than a coffeehouse, who didn't want to go to the library. He met people working in laundromats, hotel lobbies and on park benches. "One woman told me she was sick of working in The Four Seasons lobby till 2 a.m. until they kicked her out," he says.

So rather than sit in Starbucks in uncomfortable chairs, Horvat took the money he made selling the *Creative Directory* and opened TheOffice, a workspace geared to Hollywood screenwriters, a place where he'd like to write.

The centerpiece of the 1,350-square-foot facility is an 8-foot faux bonsai tree. There are 24 workstations with built-in power plugs and T-1 connections, Herman Miller Aeron chairs, a lounge area and a patio out back. There's Wi-Fi, one communal computer, free coffee ("No decaffeinated," Horvat says), and an extensive reference library (*Thesaurus of Slang*, *Dictionary of Dirty Words*, *What's What: The Visual Glossary of the Physical World*). There's no talking, fax, copy or printing services, and space costs \$6 per hour with day passes and volume discounts available. Students, Authors Guild and Writers Guild members get a 10% discount, and 1% of gross receipts go to a charity that renovates libraries.

Having opened TheOffice on March 1, Horvat is still experimenting. He used to play music (Enya) but that got "more complaints than kudos" so now it's quiet. To inspire, he's created an "it was written here" wall akin to the Hollywood Walk of Fame. "If somebody writes something here and it gets printed, published, performed or

broadcast, we'll put up their name and give them free hours," he says. I also want to put up a bell, so when somebody finishes a project, they can ring the bell and we'll give them a round of applause. So often when you write 'The End' you have no one to tell."

To drum up business, Horvat has 12 charter members, screenwriters who've made it big. One of his first customers was Joss Whedon, the creator of "Buffy The Vampire Slayer," "Angel" and now "Firefly." But his first customer was a pediatrician who works on baby care books a few hours a week. Although plans include opening more facilities in Los Angeles, Chicago and New York, Horvat admits making money is tough.

"There's no commitment to a coffeehouse, but here, for \$6 an hour, you don't want to go home and say you did nothing for 10 hours. At Starbucks you can just doodle. Even so, here, everyone around you feeds the spirit."

Kistner is the managing editor of the Net.Worker section of Network World. She can be reached at tkistner@nww.com.

Q A

Future

continued from page 71

insurance and retirement benefits. Take those away, and over 50% would be out the door, building their own careers. This is a fundamental cultural shift, fully comparable to the agricultural and industrial revolutions. How we work, where we work, with whom we work and who's in charge — it's all changing. As author William Gibson likes to say, the future is already here; it just isn't evenly distributed.

What does it all mean for American businesses?

Ware: They could become obsolete. Think about the manufacturing industries; steel in the 1970s, automotive in the 1980s; consumer electronics today. The same thing is happening in business services, financial markets and anything dependent on technology. The best electronics engineers today are in Eastern Europe and Scandinavia; the engineering powerhouses of tomorrow will likely be in China and India — not here.

The jobs of the future don't even have names yet. When I entered the job market 35 years ago, I went to an office to access the tools I needed to do my job because I couldn't afford a telephone network, a mainframe computer and two library assistants.

Today, I own my own computers, wired and wireless phone systems, a wireless LAN, a PDA, a fax machine and several printers. And I have online access to more information than I can process. Why do I need a corporate affiliation? To bring me work? No. Historically, American competitiveness has been based on an ability to manage things and people within a relatively known, stable environment. That world doesn't exist anymore.

Are businesses being built based on this change in social psychology?

Grantham: Yes, in Scandinavia and central Europe, particularly in Sweden and Slovenia. Hermes Software was

launched by four people with a vision to create a world-class software firm after the collapse of Yugoslavia in the late 1980s. They approached the government for funding and immediately went global by forming a partnership with HP. They built "social capital" by holding an annual software-engineering contest for university students, hiring the winners. Twenty years later, Hermes is one of the software powerhouses of Europe. National pride and locked-up entrepreneurial talent were unleashed.

Are any U.S. companies moving toward sustainability?

Grantham: Sure, but they're not the ones you read about in *Business Week*. Rebecca Ryan, the founding CEO of Next Generation Consulting, has just completed a study of what makes companies sustainable. She found six key characteristics: meaning (making the business mission meaningful to workers); voice (an ability to have a say in decisions); enrichment (opportunity for growth); membership (identity); appreciation; and harmony (work/life balance). SAS Institute is one; it has less than 5% workforce turnover in an industry that averages over 20% — and it's highly profitable.

If you were a CEO today, what would you do to make your company sustainable?

Ware: Sustainable means a company will be around for more than 100 years. It focuses on long-term goals, is driven by a clear vision, places a priority on finding and developing talent, and gives something back to the community. First, we'd decide explicitly on our company's core competency. Then get rid of the other 60% of our workforce, buildings and other non-essential stuff. We'd sub that work out, or better, help our middle managers in non-core areas set up their own businesses, invest in them and then contract the work back to them.

Next, we'd invest in educational, and social and public service institutions that build talent pools of potential workers, make the physical community attractive, and preserve the environment for the next generation. We'd renegotiate our contracts with the talent in the organization, and for God's sake, we'd quit calling them

employees! The employee/employer relationship is not a shared responsibility partnership. The new contracts have to be about life/work balance, performance standards and co-investments in our future. This way we can put output-based performance standards in place that we can audit.

Next, we'd take the company private. New sustainable companies need to invest in building talent pools, long-lasting relationships with business partners and increase the quality of life in their communities. That kind of investment won't fly far in a market that only sees quarter-over-quarter financial measures.

Grantham: Realize, Toni, this isn't 20 years out. There's a major social and political earthquake coming within three years. The marvelous book *The Fourth Turning* by William Strauss and Neil Howe traces the cycles of social change from the 15th century to today. Just as there are cycles to business, there are cycles to social change. The U.S. and its major Anglo-English trading partners are at a crisis point. Think in terms of the American Revolution, the Civil War, the Great Depression and World War II. Strauss and Howe call the next one the "Millennial Crisis" and believe it will become evident by 2005-2007.

What will this crisis look like?

Ware: The family structure will strengthen as a result of better work/life balance; the gender role gap will widen; new institutions will replace old ones that are crumbling; and a widely shared world view will form. A cultural shift from the primacy of the individual to the community.

Or put it this way: It's 1775 and you're living in New York City. Do you join a political party that supports King George? Or do you join ranks with Alexander Hamilton and create entirely new ways of doing business based on local values, resources and culture? ■



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You Don't Need to be an Expert To Use the SAN Tools of Experts



DR. M. K. JIBBE,
Engenio Information
Technologies, Inc.

Interoperability snafus are a leading cause of problems on storage area networks (SANs), a fact well understood by Dr. M. K. Jibbe, an interoperability expert and head of SAN testing at Engenio Information Technologies, Inc., formerly LSI Logic Storage Systems. SANs typically consist of components from multiple vendors, so Dr. Jibbe and his team spend considerable time verifying that Engenio products are compliant with standards and interoperate with components from supported third-party vendors. Consequently, they need sophisticated SAN test and analysis tools.

"Our objective is to test robustness to ensure that our array controller modules will work as advertised with the variety of SAN devices available today," says Dr. Jibbe, Manager and Lead of the Test Architect and Technology Team for Engenio. "In a large SAN, you might have 10 different vendors reading the same protocol and interpreting it in 10 different ways."

Unfortunately, component-level management tools can't provide the kind of information needed to identify and resolve interoperability problems. "Even with the tracing capabilities that we have in our array controller, and also provided by switches and host adapters, there is no way to properly isolate problems quickly unless you have a Fibre Channel analyzer," notes Dr. Jibbe, whose interoperability expertise includes 13 U.S. patents and 23 published papers. "Without an analyzer, you end up with a lot of finger pointing between vendors," Dr. Jibbe notes – a scenario some enterprise SAN managers will find familiar.

Dr. Jibbe and his team had clear requirements when they began a search for the best SAN testing tools. "We needed a very sophisticated analyzer capable of isolating all of the different SAN components—from storage devices to switches—to ensure

that all network devices are properly communicating and complying with the Fibre Channel protocol," he says. In essence, the team needed a tool capable of analyzing all interactions between SAN components in an unbiased fashion.

And because they're subjecting SAN components to vigorous levels of testing under both normal and abnormal conditions, the Engenio test team wanted a powerful analyzer that could provide fine-grain protocol information. "We strenuously test the SAN system looking for problems such as protocol violations at the low level, issues with devices taking too long to log-in, path and node failover mechanics and timing, and network load balancing, all which effect reliability, availability, redundancy and serviceability—key to any SAN customer installation," says Dr. Jibbe.

In addition, the team wanted a tool that would provide visibility across the entire SAN. "It was also crucial that we have the ability to monitor our overall SAN, so that as we fix problems we make sure we are not simply creating another. If you can't isolate specific problems to specific problem areas, you are just shooting in the dark," Dr. Jibbe says. "We want to identify issues, as well as potential issues, before our solutions are deployed at customer sites."

After a thorough evaluation of available test tools, Dr. Jibbe's group selected Finisar's Xgig Analyzer Suite, a portable protocol analyzer for 1 and 2 Gb Fibre Channel and Gigabit Ethernet SANs. Xgig automatically analyzes captured traces for errant behaviors and provides extensive performance analysis, enabling users to easily design, implement, test and evaluate SANs.

"Finisar's analyzers search and process every record in a trace file to help pinpoint specific events very quickly," says Dr. Jibbe.

The ability to rapidly diagnose and resolve problems translates into cost savings for customers such as Dr. Jibbe as well as enterprise SAN managers. Xgig enables SAN vendors such as Engenio to shorten

their product development and test cycles, for example. Similarly, by using tools such as Xgig to reduce SAN downtime, SAN managers directly impact their organization's bottom line.

While Dr. Jibbe and his team are protocol and testing experts, Finisar understands that SAN managers may not be. Consequently, as a complement to the Xgig hard-

"Finisar's analyzers search and process every record in a trace file to help pinpoint specific events very quickly," says Dr. Jibbe.

ware, Finisar developed its Expert software, a diagnostic knowledge base that embodies hundreds of man-hours of SAN expertise. Expert analyzes Xgig data, flags a variety of errant behaviors, and provides problem resolution information. Designed to help troubleshoot a problem once it's found, Expert is analogous to having an in-house Fibre Channel expert at your beck and call – one that doesn't need a salary. As one IT manager has noted, Expert makes him "look like Superman" to his colleagues.

As with all Finisar products, Xgig and Expert are continually updated to reflect evolving customer requirements and to incorporate technology advancements. Both tools are designed for a broad range of customer environments, and can scale to any size SAN installation, from the smallest to the largest.

As Dr. Jibbe and SAN managers know, SANs are complex systems, requiring sophisticated, independent diagnostic and management tools such as the Xgig analyzer. "In a SAN, the problem could be virtually anywhere on the network," notes Dr. Jibbe. "At least 90 percent of the time we're able to quickly isolate and diagnose trouble spots using Finisar's analyzers."

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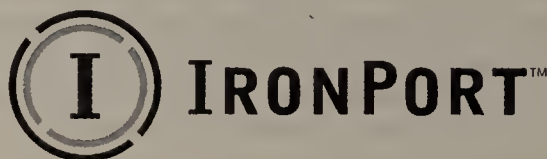
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Technology update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Personal firewalls protect vulnerable PCs

■ BY FREDERICK FELMAN

In a world of remote/mobile users and wireless access points, every endpoint PC extends your network perimeter. Obviously, home PCs are targets of worms and hackers, but white-collar criminals also target PCs as the most vulnerable part of the enterprise network. Worst of all, once the perimeter is compromised, these threats quickly spread unchecked throughout the entire network, unless you have the proper protection. Think of the recent rampages of MSBlast or Sasser.

The solution is a personal firewall, which complements traditional defenses such as gateway firewalls and anti-virus efforts. A personal firewall is installed as software on each end-user computer, and it blocks inbound and outbound threats. Personal firewalls can monitor and control not just network-level but also application-level traffic.

Inbound protection

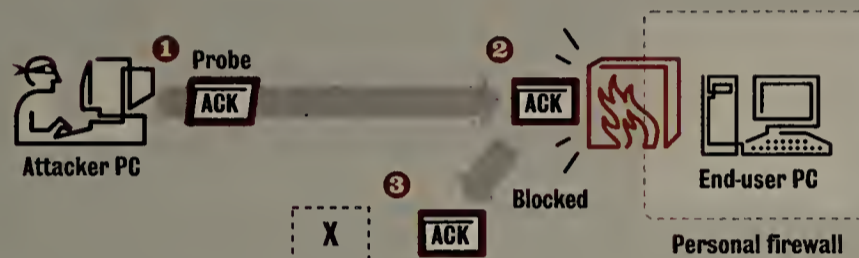
Like a perimeter firewall, a personal firewall can open and close ports. For example, the Sasser worm attempts to connect to endpoint PCs via TCP Port 445. A personal firewall will close that port and prevent the target PC from becoming infected, even if it is running an unpatched, vulnerable operating system.

Gateway firewalls close ports by refusing to transmit inbound TCP packets. Users or administrators can close ports to all traffic or to traffic that matches user-defined conditions — source IP address or domain, for example. In contrast, a personal firewall eliminates the need to program a firewall in the traditional, complex way that depends on such detailed knowledge of

■ HOW IT WORKS

Personal firewall

A personal firewall protects PCs by blocking inbound and outbound threats. The firewall can operate in stealth mode to make a computer invisible, preventing attackers from realizing that a PC exists at the target IP address.



- 1 Untrusted PC initiates probe or attack.
- 2 Attacker's SYN packet or spoofed ACK packet arrives at end user's PC.
- 3 Personal firewall ignores packets from untrusted IP address. Does not pass traffic through and sends no acknowledgement of refused packets. By operating in stealth mode, the target PC appears to be switched off or absent from the network.

ports and protocols. Instead, personal firewalls use an application-centric approach to traffic control, opening and closing ports based upon the applications that users approve.

Additionally, a personal firewall can operate in stealth mode by making the PC invisible to outsiders, offering even more protection. For a closed but unstealthed port, a personal firewall would send a "denied" response to the originator for each refused packet. This lets the initiating computer know that the communication attempt is bug-free because the target PC is refusing the connection. However, attackers can glean information from examining refused

packets — operating system, security configuration and, most importantly, that a PC exists at the target IP address. In stealth mode, a PC does not respond to unauthorized packets. The hacker doesn't even know the PC is there.

Even if a port is open and accepting communication, a personal firewall can filter out malicious connection attempts through stateful packet inspection. By examining each inbound packet to see if it's in response to an earlier request by the target PC, a personal firewall determines which packets are legitimate communication and which are probes.

Outbound protection

Personal firewalls provide application control by monitoring all applications' requests to an operating system to communicate to the Internet. The firewall driver associates each application with the traffic it initiates. Then, the firewall allows or denies that traffic according to the rules defined by an end user. This prevents unauthorized applications from successfully making outbound connections to the local network or the Internet. Personal firewalls can catch spyware, Trojan horses and viruses' SMTP servers the instant they attempt to propagate or "phone home."

Malware designers compensate for this by spoofing or even hijacking approved programs to facilitate malicious communication. Personal firewalls protect against this via application authentication, checking applications not simply by filename but by MD5 hashes of EXEs, Dynamic Link Libraries and other components. If a program has been altered, it's not allowed out without user approval.

Personal firewalls also can provide additional protection such as hardened defenses against direct attacks, even during bootup; immediate protection via default settings; automatic network detection with enforcement of appropriate security policy; and a built-in knowledge-base for responding to or remediating security events.

Personal firewalls provide effective front-line defense against human and automated attacks and can prevent the spread of malware within corporations.

Felman is vice president of marketing for Zone Labs. He can be reached at ffelman@zonelabs.com.

Ask Dr. Internet

By Steve Blass

I just read your column about offline forms (www.nwfusion.com, DocFinder: 2531). Have you considered Formatta's online form tools or using PDF forms? The Formatta tools perform all the functions mentioned in the column, and add security features such as locked (password-protected) fields and encrypted data storage. PDF forms can be created with Open Office (www.openoffice.org) or Adobe tools, and are less likely to become corrupted or infected by viruses or worms.

Formatta's offerings do provide offline completion, plus online submission capabilities, and the form filler client is free to download and use. These forms are published in a proprietary binary format by using the Formatta Designer application, which is reasonably priced. There is a full-featured trial download at www.formatta.com.

PDF forms are another multi-platform option for deploying forms-based content. Typical PDF fill-out forms are published to be completed and printed,

rather than posted to the Web, but Adobe's Acrobat does provide the means to support form submission. OpenOffice Writer provides an open source alternative for creating PDF forms that can be coerced into creating PDF forms for online submission.

Blass is a network architect at Change@Work in Houston. He can be reached at drinternet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark
Gibbs



Last week we delved into the intricacies of an interesting system called DidTheyReadIt that lets you track whether people read your HTML-formatted messages, even if you don't enable the "request read receipt" service.

Goof Department: Last week we said messages destined for Hotmail, Yahoo or AOL were special cases and had to be tracked by adding ".didtheyreadit.com" to the address. Turns out we got it wrong, and now everything works fine without the added extension.

But there is a good reason to send mail by appending ".didtheyreadit.com" to messages — it ensures that the message is "burst" to all addressees with a separate ID number for each recipient instead of all being covered by a single ID. And if you use a Web mail service, it is the only way that you can use DidTheyReadIt.

If you don't route your messages via their server, when you examine your

The rest of how DidTheyReadIt does it

online DidTheyReadIt log, you still will see when different users rendered the message. They can be distinguished because they will have different IP addresses and different HTTP referrer strings and browser ID strings. Note that you can have DidTheyReadIt send you an e-mail when each recipient first opens the e-mail and, optionally, on every subsequent read.

Logging could be improved

A few comments: First of all, DidTheyReadIt's logging is far too simple. You can't sort by name, date or any other attribute — the list is simply in a sort of time sequence. The problem is that when an existing record is updated because the message was read again or read by another recipient, the record is updated but stays in the "first created" time sequence. Also, you can't download the log.

And there's the issue that the log will show an entry for yourself when you read a reply that quotes your original message. Not a big problem, but the system should flag the entry.

One interesting thing that the log entries show is read duration. This is determined by using a persistent connection to send

the embedded image back to the reader. When the connection is broken, it is safe to assume that the reading has ended.

An option lets you have read times of more than two minutes divided into multiple two-minute reads. This is an odd decision. It would seem more relevant to determine the time it should take to read the text content (fine unless the recipient is a particularly slow reader) and assume that for any duration over that time the recipient simply hasn't closed the message.

How well does it work? Alastair Rampell, the CEO of Rampell Software, publishers of DidTheyReadIt, wrote to us to explain: "I would estimate that nearly 99% of e-mail clients out there render image tags because of the predominance of Outlook, Outlook Express, Hotmail and Yahoo. While we do not have access to the contents of messages sent via our system (and you can verify this by watching the background tracker), we do know how many messages are sent per day, and we also know how many receipts are rendered. Over 90% of e-mails sent during our testing period (with several hundred random users) triggered receipts. . . . If absolutely everyone with whom you

communicate is a diehard PINE user, then our software is not useful. But [the majority] of people use HTML-compliant e-mail clients, and even though Outlook 2003 can block external images, a) it doesn't block them for people in your address book or people with whom you regularly correspond, and b) a lot of people turn this off because [it confuses them when] their e-mail from Expedia or PayPal has a bunch of holes in it. That's why we compare the product with caller ID — it will work most of the time but occasionally you will have an 'unavailable caller' or 'private caller.'"

In our tests we found DidTheyReadIt to be a useful service that works well. We would like to see the reporting improved and we'd like to see support for downloading. And something that we'd really like to see is better integration of tracking results with client-side messaging — in Outlook, perhaps custom forms for tracked messages so that status could be shown.

You can try a free version that will track a maximum of 10 messages, or subscribe for \$25 for three months, \$40 for six months or \$50 for a year. Pretty cool.

Make tracks to gearhead@gibbs.com.



CoolTools

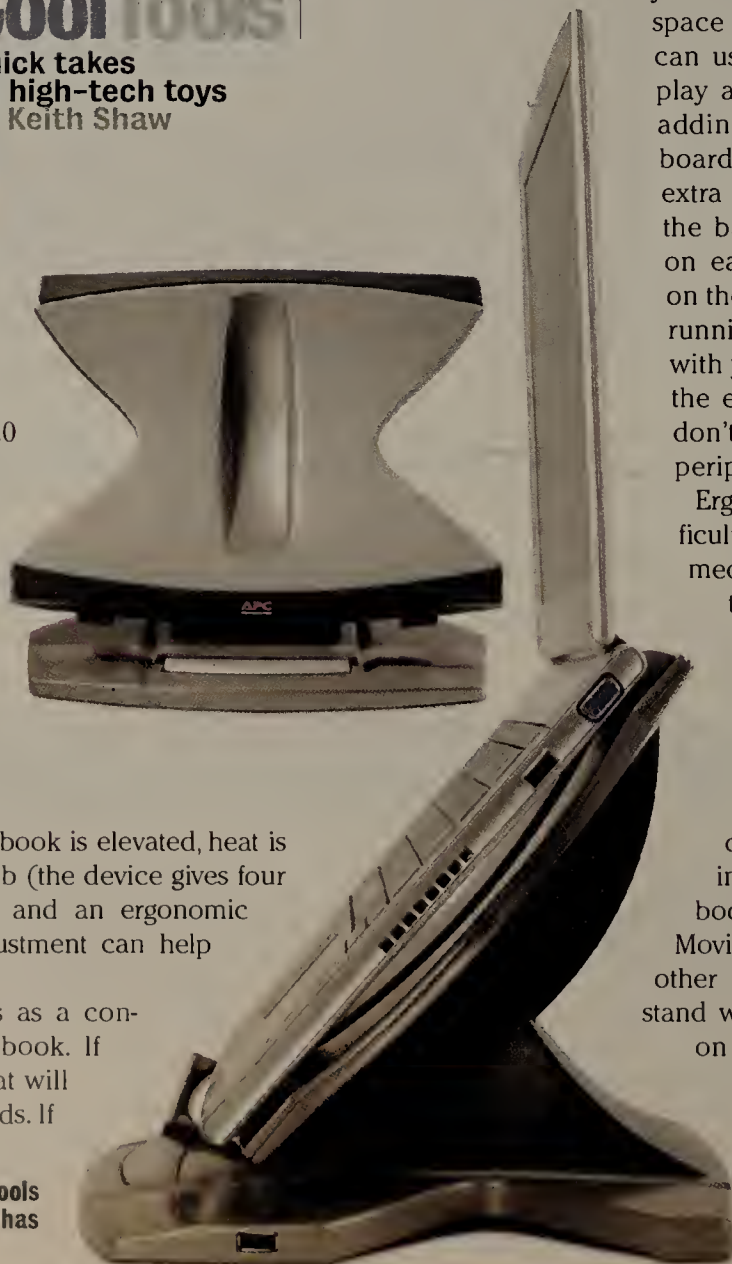
Quick takes
on high-tech toys
By Keith Shaw

The scoop: Ergonomic Notebook Stand with USB 2.0 Hub (ENS-USB), from APC, about \$100.

What it does: This is an amalgamation of several devices, including a docking station for a notebook (when used in the "up" position you can eliminate an external monitor and use the notebook's display as your monitor), a notebook cooling device (when the notebook is elevated, heat is dissipated better), a USB 2.0 hub (the device gives four extra ports to the notebook) and an ergonomic device (a two-step height adjustment can help reduce back and neck strains).

Why it's cool: Think of this as a converged device for your notebook. If you're looking for a device that will cool your notebook, it succeeds. If

APC's Ergonomic Notebook Stand cools your laptop, saves desk space and has four extra USB 2.0 ports.



you're looking to save some space on your desktop you can use the notebook's display as your monitor while adding an external keyboard. The addition of four extra USB 2.0 ports (two on the back of the stand, one on each side) is the icing on the cake. If you're always running out of USB ports with your notebook, having the extra ports means you don't have to unplug your peripherals.

Ergonomic settings are difficult to judge (we're not medical experts), although this device lets you place your notebook in three different positions to help relieve muscle strain. We found that we could comfortably work on a coffee table in our living room with the notebook in the flat position. Moving the notebook to the other two positions on the stand would be good for use on a desktop, and would require the external keyboard.

Grade :
★★★★★ (out of five)

The Powerline Ethernet Adapter from Belkin quickly and easily connects your computer via Ethernet cable to a home network through any power outlet.



The scoop: Powerline Ethernet Adapter, from Belkin, about \$100.

What it does: The adapter connects your computer via Ethernet cable to a home network through any power outlet. When one adapter is used with the computer and the other adapter is connected to a router, the PC can connect to the Internet. The adapters also can be used to connect two computers to each other through the powerline system within a house. Anywhere you have a power outlet, you can connect a PC to a network via the powerline adapter.

Why it's cool: We love how the adapter quickly plugs into any power outlet on the wall (Belkin recommends not plugging it into a power surge protector, though) and does it through Ethernet (we love using Ethernet more than USB cables, which other adapters use). The adapter connected to our network rather quickly and easily, and the configuration utility lets us set up a 56-bit encrypted power-line network quite simply. Giving your network the ability to expand beyond wireless (let's face it, some areas don't do wireless well) makes this a worthy investment.

Grade: ★★★★★

Shaw can be reached at kshaw@nww.com.

ANOTHER EXPERT WEIGHS IN ON THE TCO OF WINDOWS AND LINUX.



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Equifax Inc.*

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ON TECHNOLOGY

John Dix

Powell gets his way on bundling

The recent decision by the U.S. solicitor general not to appeal the lower court decision that gutted the FCC's unbundling rules will mostly hurt competitive carriers serving consumers and small businesses.

But we are at an interesting juncture in the evolution of the market, with nationwide competition now heating up between the Baby Bells and the long-distance carriers, so the decision might have broader implications.

One thing is clear. Local exchange carriers such as Verizon and SBC will raise rates for so-called unbundled network elements, which they have been forced to make available to competitors. SBC, for example, while saying it is concerned about marketplace disruption, only committed to keeping rates the same "at least through the end of this year."

That might force some weaker competitive local exchange carriers (CLEC) out of business. And is causing the largest of them to squawk. For example, MCI, which has a huge local business, issued a release saying: "If the FCC's rules are allowed to lapse and wholesale rates rise MCI may be forced to raise prices in some markets and pull out of others."

(MCI says that, of the 19 million consumers that switched their phone service to competitive carriers, 3.5 million have picked MCI's all-distance service, The Neighborhood.)

The operative words in MCI's statement, however, are "may be forced." It is unclear if the big CLECs — AT&T included — can afford to retreat from local markets, regardless of the fees, and if they will pass on higher fees or simply eat them. Much of the bantering is probably for political affect.

The politics of this whole effort are intriguing.

While it appears strange to have the solicitor general — a representative of the Bush administration's Justice Department — going against the wishes of the FCC, which is headed by Bush appointee Chairman Michael Powell, just the opposite is true.

Last March, Powell was in the minority when the FCC voted in favor of keeping bundling, so technically this is a win for him. "He might have lost a battle, but it seems like he is going to win the war," says David Rohde, a senior analyst with TechCaliber.

If nothing else the decision, coupled with the news last week that the Supreme Court refuses to extend UNE rules, indicates that the days of UNE are numbered. This will push adoption of VoIP and wireless as access alternatives, which can be viewed as a good thing for the industry as a whole.

— John Dix
Editor in chief
jdix@nww.com

Missed opportunity

Your story "Are you l33t?" (www.nwfusion.com, DocFinder: 2525) did a disservice to l33tspeak by ignoring its usefulness to your readers: l33tspeak is a great way to further obscure passwords while also making them easy to remember.

For example, many people use their kids' names as a password. Typically, this might be in the form of "JohnJane" — fairly easy to guess by anybody with a fleeting knowledge of the account holder. But if the account holder switches that to "J0hnJ4n3," the password is suddenly not so obvious.

Mind you, products such as the L0pht tools allow for character replacement as part of their brute force attacks, so l33tspeak isn't about to save the world in this respect. However, combining l33t with something like mnemonics ups the ante quite a bit. Take a phrase such as, "Why oh why do I have to make this password," change it to "y0yd1h2m7p" and, not surprisingly, you have a password that will stand up against most attacks.

So while it might have been fun to write a story debasing script kiddies, it would have been better had you examined the useful side of hacker/cracker shorthand.

Travis Prebble
State College, Pa.

What worries you?

Regarding Mark Gibbs' Backspin column "Worry, worry, worry, worry" (DocFinder: 2526): Face it, software is all about trust. We trust the companies from which we "license" (not buy) software to not take advantage of our "license" (not purchase) decision when we install their products. Our trust is rewarded

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

with the End User License Agreement, which gives almost total protection to the software developer and little or no recourse to the end "licensee."

What's to stop any software developer from hiding code in its application to harvest identity information and credit card numbers, forward any interesting-looking documents or e-mails, and so on?

Jay Jordan
St. Louis

I am worried that a hacker will figure out a way to corrupt the automatic updates that are so popular for time-pressured security administrators and users who just don't want to be bothered but want to be secure. Microsoft is probably a target, but so might be the many anti-virus vendors that are constantly updating signature files. I suspect that many hackers would like to turn the tables on these vendors. These processes are widespread and often trusted and able to run on the PC. I prefer to have an inside site with which PCs can check that has been manually updated with tested content — thus, of course, slowing down the process of getting up to date.

Bruce Bibee
Los Angeles

I recently reinstalled Windows XP onto a PC that was loaded with viruses. I used the fdisk utility to erase and recreate the bootable partition, then reinstalled everything from scratch. I then installed Ad-Aware and ran a scan. The scan picked up eight instances of spyware installed on the computer. The only Web site the PC had visited prior to Ad-Aware was windowsupdate.microsoft.com.

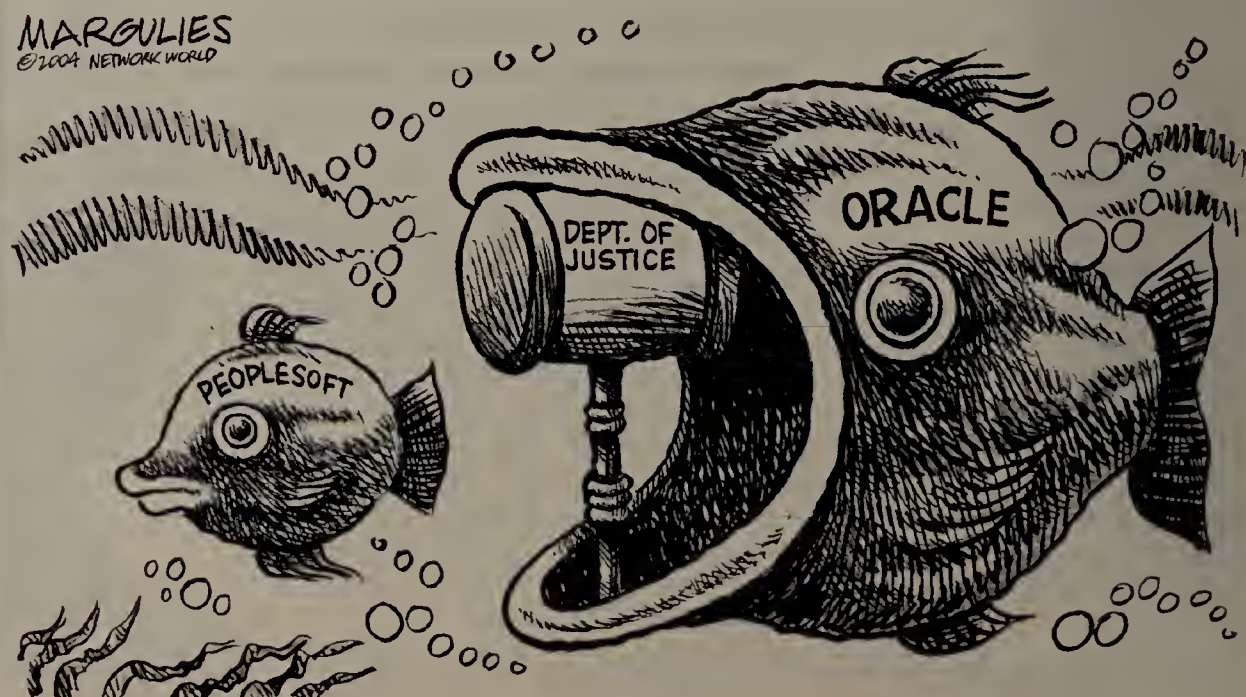
After the Ad-Aware scan, I went into the properties of the spyware items and found Microsoft had installed them all. This really makes me wonder what else is being installed on my computer that programs like Ad-Aware do not detect.

Ron Schmiegelt
Houston



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MARGULIES
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INTERNET ADVISOR

Daniel Blum

Worms and viruses plaguing users worldwide are symptoms of weak security in Windows and other programs. But so far, vendors are doing more to combat the disease's symptoms than its root cause.

Microsoft in particular has addressed its vulnerabilities by focusing on patch management and network attachment controls. New service packs for Windows Server 2003 and XP will enable better automated patching and let administrators quarantine PCs that do not have the appropriate patches, personal firewalls and anti-virus software installed.

Yet these protection measures are only marginally successful as worm and virus builders improve their skills. New worms, such as Sasser, are developed just days after vulnerabilities are published. Even with automated patch management, customers need time to properly test and install the patches.

Microsoft also has touted its improved security configuration management. The Internet Information Server (IIS) is not installed by default anymore, for example, and when it is installed, dangerous features such as dynamic content are turned off. Microsoft also supplies prescriptive guidance for further locking down the server.

Locking down settings reduces the so-called "attack surface" but leaves vulnerabilities under the surface. Privileged users can toggle the settings back on, and they will. Malicious programs also might toggle security settings on or off.

Problems arise because Microsoft has bundled a great quantity of complex functionality into just a few Windows operating systems pack-

Fight the cause, not the symptom

ages comprising an estimated 60 million lines of complex, interdependent code. "Integration" has been the marketing mantra and design goal.

On a domain controller it is possible to install IIS or even invoke ActiveX — a prime vehicle for Trojan horse programs — within Internet Explorer. This bundling works for small businesses that need to run everything on one server, but it makes no sense for large companies that use domain controllers for single sign-on to huge forests of resources. In such environments, the domain controller holds the keys to the kingdom and Microsoft should — at a minimum — create a stripped-down system for the domain controller role.

Wrapper defenses — which run the gamut from network firewalls, to host firewalls, to host-based intrusion detection and response software — can prevent worms or viruses from entering the network or from taking control of infected hosts. Unfortunately, many wrappers rely on signature-based detection, generate false positives, or are cumbersome to manage. Because wrappers also can interfere with legitimate applications, flexible policy-based control is key. Customers also should evaluate newer and better software products claiming the ability to stop memory-based attacks that worms use, such as buffer overflows.

But until Microsoft and other vendors address the root causes of vulnerability by creating smaller, more modular packages to perform different roles, heightened attention to wrappers and strong system administration will be customers' best defense.

Blum is senior vice president and research director with Burton Group, an integrated research, consulting and advisory service. He can be reached at djb-feedback@earthlink.com.

Problems arise because Microsoft has bundled a great quantity of functionality into just a few Windows operating systems packages . . .



REALITY CHECK

Thomas Nolle

Earlier this month, start-up Axiowave released its XCR128 convergence router. Last month, Cisco announced its CRS-1, and Juniper announced its Infranet architecture. Earlier in the year, Avici announced a marketing deal with Nortel. Tellabs is rumored to have won a deal with Verizon on the prod-

uct it acquired with Vivace. On the flip side, start-ups Tenor and Equipe folded. There might be a router war starting, but what's the battleground?

Axiowave thinks the battleground is QoS and legacy services, and you could also say the CRS-1 is Cisco's belated adoption of a more Multi-protocol Label Switching-centric architecture, one its competitors adopted earlier. Even Avici's focus on high availability could be called a legacy-over-IP story, given the traditional five-nines telco requirement for reliability. But legacy and QoS aren't the answer, because every major carrier acknowledges that legacy service revenues are declining at near double-digit rates.

Tellabs, Vivace, Avici, Nortel, Alcatel . . . all of the partners or buyers in the recent deals between start-ups and incumbents think the router wars are all about relationships. The old-line equipment vendors' sales forces know whose hands to shake, so give them a chance to sell vital new gear and they'll turn the market on its ear. Certainly partners are a necessity for start-ups, owing to the historical conservatism of major carrier buyers, but no carrier is going to buy a lousy box from an old sales friend if it compromises the buyer's career. A strong sales conduit can move a good product into the carrier arena, but not a weak one.

Juniper's Infranet announcement suggests that the key to the router wars is a different kind of relationship, one between networks and computing intelligence. But Juniper's acquisition of security edge player NetScreen Technologies earlier this year might provide the real insights. Juniper is moving to the network edge, away from its traditional core incumbency — moving into corporations, broadening its markets beyond its familiar carrier focus. The simple reason for the move

No winners in the router wars

is that all hardware sales reduces to selling lots of boxes, and the best place to do that is where most boxes get installed. Look at any network diagram and you'll see thick concentrations of devices at the edge and a sparsely populated core. The world market for terabit routers is in the hundreds of units, but one company easily could buy 1,000 edge routers.

But it's not just the "more boxes at the edge" truth that makes the NetScreen deal interesting; it's the security angle. Cisco's deal with Linksys shows that the inevitable result of mass-market broadband is commoditization of the customer edge. The router that Cisco used to sell to branch offices for \$10,000 now could be put on a chip and sold to a teenage gamer for \$100. Does anybody really think Linksys will be just a cheap router in the future? It will be a digital rights manager for content, a VoIP portal, a bunch of higher-value things — because it has to be to sustain profits. Just fleeing to the edge doesn't necessarily create profit growth. You have to flee routing as well.

The router market is maturing, the vendors along with the products. But it's also dying as we know it. At the core, it will be pressured by optics and at the edge by increased competition and the need to lower the price of the boxes to drive a market expansion focused more on consumers and small and midsize businesses. Security and cost concerns will drive most of the traditional router features out of the customer edge devices. All the features of the network of the future will end up concentrated in a thin layer at the provider edge, connecting commodity customer premises equipment with fat-pipe optics.

The trends we see today aren't a sign of a router explosion, but the beginning of an implosion. There will be no winners in the router wars; the survivors will morph into something else. The router giants of today will be giants tomorrow because they're able to figure out what the successor product to routers will be.

Nolle is president of CIMI, a technology assessment firm in Voorhees, N.J. He can be reached at (856) 753-0004 or tnolle@cimicorp.com.

The router market is maturing, the vendors along with the products. But it's also dying as we know it.

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New corporate video portals combine conferencing and content management to grab employees' attention, increase collaboration, enhance e-learning and even generate revenue.

Video Portal Power

BY EVAN ROSEN

OUR philosophy at Cat is you don't start your day with Wheaties. You start it with the Cat portal," says Gus Otto, who manages business-collaboration infrastructure for the \$23 billion-per-year industrial equipment manufacturer in Peoria, Ill.

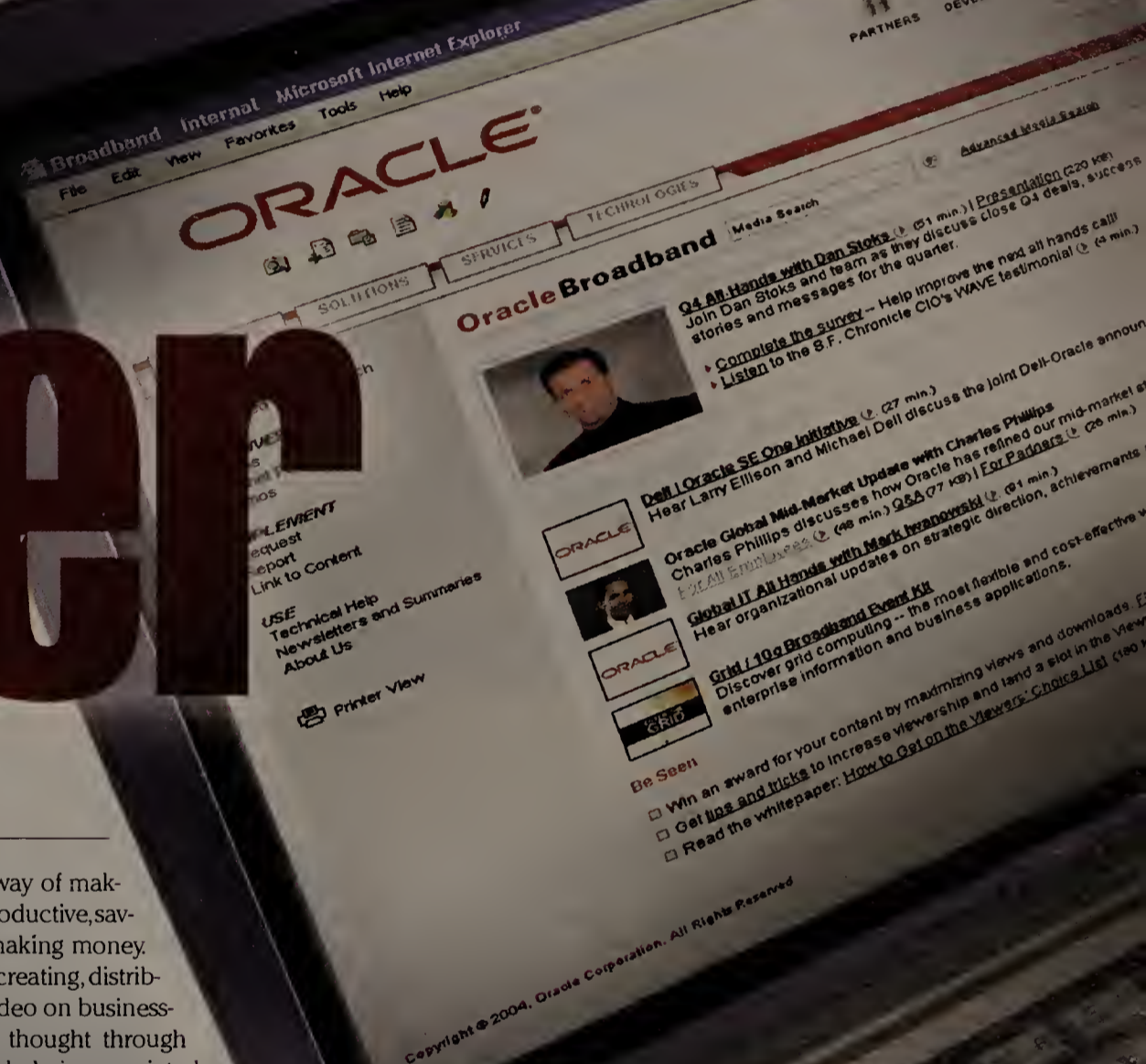
Caterpillar is integrating video-specific portals with business-unit portals and the company's intranet home page. From Caterpillar's portals, users can watch "Background News," a daily company newscast. A communications tab provides access to executive speeches and corporate communications. Just as users use television to capture the attention of consumers, Caterpillar uses the video portal to grab employees. "You have to have engaged employees to increase your bottom line," Otto says.

One new way to deliver content is increasing

communications as a way of making employees more productive, saving money and even making money. The changes focus on creating, distributing and displaying video on business-unit portals. "We have thought through the entire technological chain associated with video," says Tony Raimundo, Citigroup's senior vice president for digital media and collaboration technologies. "We standardized how people create, distribute and watch video."

The goal for the company is to enhance more than 400 Citigroup internal portals with live and archived video. Rather than force viewers to watch content on a specialized video portal, Citigroup delivers content to the virtual space in which people work. "My fixed-income division does business all day long on their portal. We're adding video to that portal," Raimundo says.

The trend toward



Oracle delivers video in two places — a central portal and organizational portals, such as a sales department portal.

video portals is significant," says Andrew Davis, a senior analyst with Wainhouse Research. "It straddles two worlds that are colliding — conferencing portals and content management portals."

Conferencing portals let users schedule and launch videoconferences and Web conferences.

Content management portals provide the ability to search key words and pull up a variety of data types including images, video, documents, slides and audio.

"Suppose I'm working with you and three other guys developing a new coffee cup. You've got the specification document. Someone else took photos of competing coffee cups. There's a streaming video of the CEO of a competitor talking about the coffee cup market. I want to be able to go to an integrated portal and see all of that content," Davis says.

Oracle uses a dual approach to video portals. Besides creating a one-stop-shopping portal for all video content, Oracle also is including much of that content in existing portals. "We have a comprehensive rich media portal that has also been stripped across other organizational portals like the North American sales portal and the government, education and healthcare portal," says Nathaniel Robinson, who runs a video production and distribution service group within Oracle.

The Redwood Shores, Calif., company launched the group five years ago after realizing the cost per attendee of streamed video presentations is \$2.50 compared with \$350 per attendee at a hotel. Robinson's group has deployed a homegrown universal player that provides a video/audio window, a data window and a browser displaying links to related content.

Oracle also uses video-logger technology from Virage, now a division of Autonomy. The Virage product logs each video clip, creates an index from the audio and allows keyword searches so that users can retrieve content. "The rich media adds this element — people are very familiar with their TV and respond well to it," Robinson says. "Video is such an engaging experience, and the retention is so much better than sending someone a Web page."

The new corporate communications

While e-learning has been the most compelling use of video for many companies, video portals are giving them the opportunity to create an order-of-magnitude shift in corporate communications. Used effectively, video can capture employees by entertaining and informing them. Because users can access all video content from a business-unit portal or video-specific portal, corporate communicators can generate "stickiness" for messages by putting critical content where it will be viewed.

Some videoconferencing rooms rapidly are becoming content-creation facilities thanks to videoconferencing-to-streaming gateway hardware from a company called Starbak. Early customers include Johnson & Johnson's Ethicon subsidiary, Lockheed Martin and the Common Fund, a Wilton, Conn., mutual fund company.

The gateway, a hardware appliance, "gives the videoconferencing legs," says Arthur Landry, the Common Fund's voice-and-video manager, by converting it to a Windows Media stream that can be included on video portals or put on a DVD. "Any videoconference we do we can archive to a streaming server," he says. "That includes everything [in the audio and video] as well as the associated PowerPoint."

Videoconferencing from portals

As videoconferencing evolves from an island of technology to a single capability of video portals, companies see huge potential in cost savings. "We have videoconferencing systems expiring under leases," Caterpillar's Otto says. "I'm thinking maybe I don't need hardware any more. Our room videoconferencing usage has decreased. Our Web conferencing has gone through the roof." Otto says he expects to add videoconferencing capability to Caterpillar's video portal and business unit portals sometime next year.

Caterpillar also uses the MediaMall appliance from Certeon to distribute and re-host video on underutilized LAN servers, reducing use of the WAN for streaming content.

"Videoconferencing won't be big until it permeates the desktop, and it won't permeate the desktop without portal technology," Davis says.

Many companies plan to add the ability to join videoconferences through instant messaging and audio-only Web conferencing. The idea is that if employees travel and use notebook computers with limited-bandwidth connections, they still can participate in video meetings in a limited way. "We look at real-time collaboration as a multimedia environment. Whether you're on an analog or IP phone or whatever, you ought to be able to join in a videoconference and gain knowledge," Otto says.

24-hour executive communication

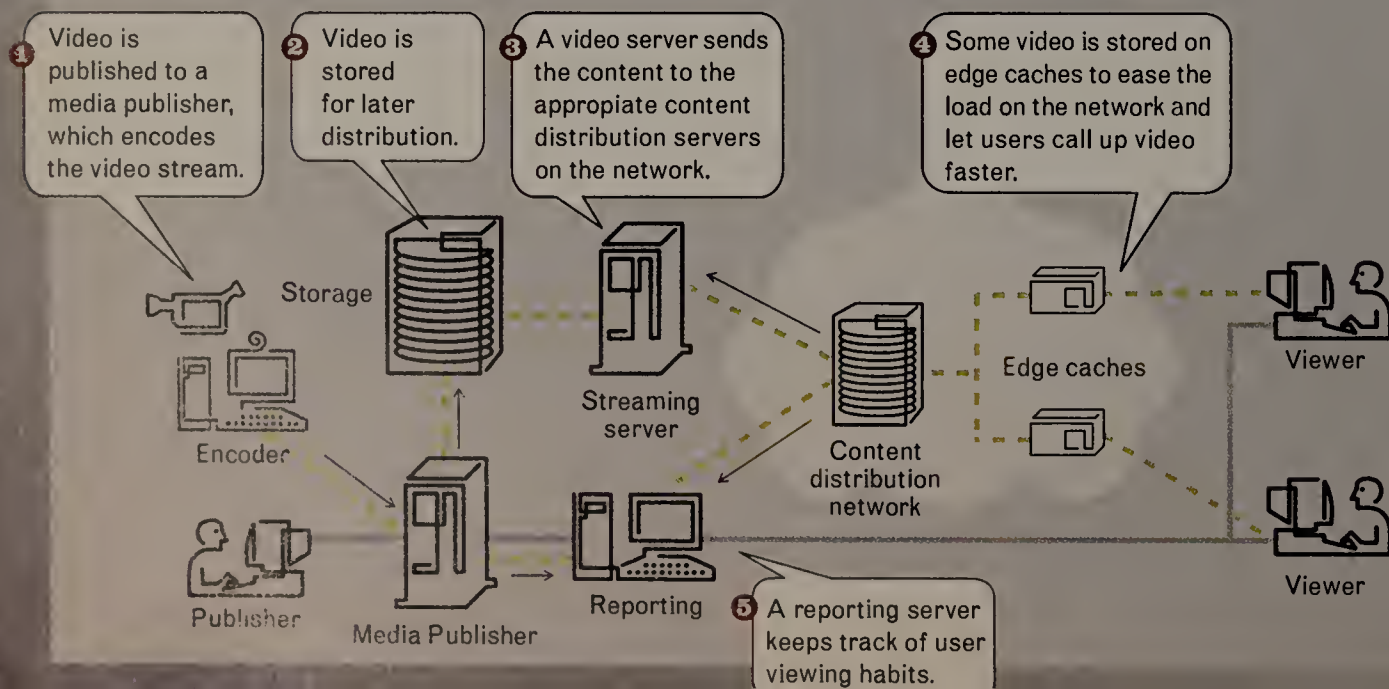
For many executives, video portals provide the opportunity to reach large numbers of employees without leaving their offices or adjacent conference rooms.

For example, an HR executive might want to update employees on changes to the benefit plan. A sales executive might wish to address field sales representatives globally. "One of our executives has to visit 500 offices in a year," Citigroup's Raimundo says. "If she can reach 20,000 people

See Video, page 84

See net

In a typical scenario, a video portal would include a publishing system, a content distribution network and an easy way for end users to view the content.



Set up a video portal on your network



Implementing a video portal involves several software and hardware components typically from different vendors. "The biggest concern is remaining agnostic and staying with open technology," says Eric Anderson, president of Media Publisher. Here are nine steps to set up a video portal:

INVESTIGATION.

Research other enterprise implementations to learn from successes and failures. Find out about business uses and technology approaches.

PILOT PROGRAM.

Choose a motivated business unit with managers who appreciate the benefits of video. Use results of the pilot to show key decision-makers how video portals can streamline corporate communications, marketing, training and other functions.

BUSINESS ANALYSIS.

Get input from CEO, business unit heads, human resources, marketing and corporate communications. Determine what types of content and the volume of content each business unit will create. Determine which content will be distributed live and which will be archived.

ASSIGN VIDEO TEAM.

Consider creating a dedicated position or team to handle video control and management.

NETWORK ANALYSIS.

Analyze topology of the network. Determine the number of branch offices and the speed at which they can connect to the network. Determine whether the network is multicast-enabled. Decide what type of video indexing and search capability is required.

FORMAT AND STANDARDS SELECTION.

Decide which formats your video portal will support. These might include MPEG2, MPEG4, Windows Media and Real.

SELECT VENDORS.

Enterprise Content Delivery Network (Network Appliance, Cisco, Certeon).

Video management, aggregation and portal (Media Publisher, The Platform, Kontiki).

Videoconferencing-to-streaming gateway (Starbak)

Video logging, indexing and search (Virage division of Autonomy, Nexidia, eMotion).

INTEGRATION.

Ensure all of the pieces fit together. Integrate with Lightweight Directory Access Protocol user database.

DEPLOYMENT.

Consider a final pilot before enterprise-wide deployment.

— Evan Rosen

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Video

continued from page 82

at once, that can be very valuable."

Citigroup has chosen MPEG1, MPEG4, RealNetworks' RealPlayer and Windows Media as standard video formats. Raimundo's group also has deployed Cisco's

Enterprise Content Delivery Network, which re-hosts content on servers closer to users and converts multicast to unicast for segments of the network that are not multicast-enabled.

Citigroup has implemented a video publishing and management system from Media Publisher, which routes video and

controls scheduling and resources. The system lets employees publish video content but provides centralized control over who may access each video clip and how long each clip remains available. The system also reports who has viewed each video.

As video portals give corporate commu-

nications departments more powerful stay-in-touch tools, global corporations ultimately can create 24-hour live company news feeds available through portals, sort of an internal CNN. During the boom years of the late 1990s, Oracle launched a 24-hour streaming "channel" called the eBusiness Network that focused more on industry trends than on company news. However, with the economic bust came the network's demise. "We created all our own programming," Oracle's Robinson says. "At one point, we had 12 different shows verging on edutainment."

Turning assets into profits

Beyond corporate communications, video portals and the back-end technologies supporting them give companies the opportunity to create, manage, distribute and capitalize on multimedia assets. "With our smart people — bankers, economists, equity researchers — in front of the camera, we can create valuable intellectual property and then turn it into video assets," Raimundo says. "We can then show those assets to customers. That's very powerful."

Those assets can be profitable, if you ask Gerry Kaufhold, an analyst with In-Stat/MDR. "Once companies start making money with their portal, there's no turning back. It will be an alternative to TV."

As video portals take hold, companies are considering two primary directions for their evolution. One option is to add increasing functionality to video portals including videoconferencing and indexing, search and retrieval of all media types including images, presentations, audio and text. In this scenario, the corporation must internally market the video portal as the enterprise communications hub, a project driven by corporate communications at least as much as IT.

Another option is to build all video portal features into business unit portals. "The reason people have gone with video-only portals is that by focusing on one media type they can do a deeper, richer job," says Tom Pinckney, CTO of appliance vendor Starbak. "However, I'm betting this will become a checkmark feature for broader portal vendors."

Undoubtedly, companies will enrich video-specific portals with other data types. The decision whether to include video portal capability on business-unit portals or create, manage and market video-specific or communication portals ultimately will depend on organizational culture. In corporations where employees spend most of the day working from business-unit portals, it likely will be more efficient to bring video content to them. In cultures that emphasize corporate communications and in which business-unit portal usage is limited, the communications-specific portal will fit business needs more closely.

Rosen speaks on communications topics and is chief strategist at ImpactVideo Communications. He can be reached at erosen@impactvid.com.

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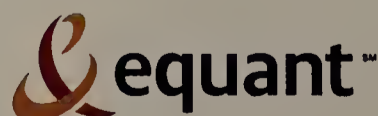
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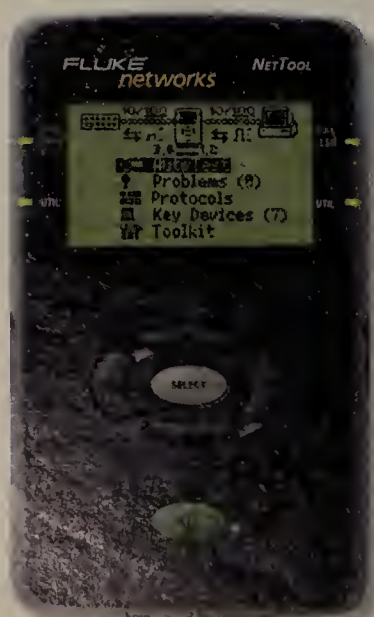
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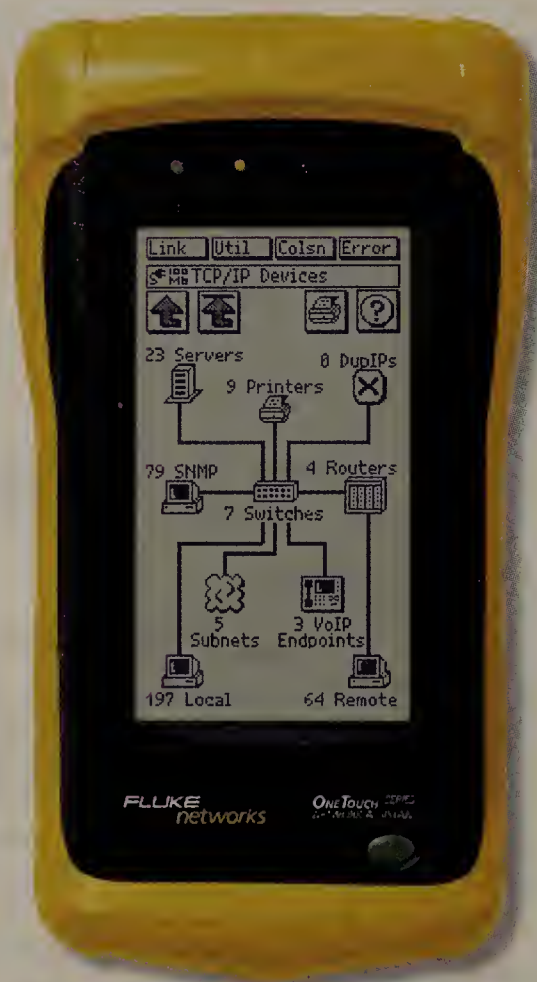
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NetworkWorld **SECTOR** **SPOTLIGHT** **AEROSPACE**

How emerging technologies are transforming key vertical industries.

Grid computing takes flight

NASA and Boeing launch grid systems to share resources, contain costs.

■ BY DENISE DUBIE

Piyush Mehrotra isn't exaggerating when he says the data collected and maintained by his organization's computing systems spans the universe.

In fact, data collected by instruments in space might overload even the most advanced computing systems at NASA if the organization didn't use grid. Mehrotra, senior scientist and lead on the grid integrated project team at NASA Advanced Supercomputing Division, part of NASA's Ames Research Center in Moffett Field, Calif., says grid computing gives his team a cost-effective means to store and maintain volumes of data used in projects examining the Earth, solar system and universe.

Grid computing pools processing cycles from multiple computers to maximize capacity, memory, power and other resources distributed across multiple systems. The concept of a grid describes a framework in which heterogeneous and distributed computational, networking, memory and storage resources can be linked to serve the needs of particular user applications, according to Nemertes Research.

Mehrotra says NASA started on its own with grid in 1996 and in 1997 began working with the Globus Alliance and its Globus Toolkit, an open source implementation for building grid-enabled applications. Grid proponents say the technology lets IT squeeze more out of their servers, storage and systems.

NASA initially deployed grid computing to share resources between locations, but now plans to use the technology to support critical projects and space missions. "Our original goal for investigating grid computing was to make more efficient use of NASA's computational resources and to allow scientists and engineers easier access to these resources," Mehrotra says. "[Now] we are investigating the use of these technologies for mission operations; both for mission and payload control and management."

Gaining momentum

Once primarily a tool for leading-edge research engineers, grid is becoming more mainstream for enterprise IT departments in aerospace companies in particular. Bob Parker, industry analyst at AMR Research, says aerospace firms use grid more than other sectors because of the nature of their work. "Designing an aircraft carrier requires a lot of computing cycles, for example, so you will see these companies making a concerted effort with grid computing around a certain task," Parker says.

According to Insight Research, total worldwide grid spending will increase from \$250 million in 2003 to approximately \$4.9 billion in 2008. It forecasts enterprise grid deployment to shift from early adoption to more widespread pilots and production launches this year.

A grid computing system manages two supercomputers at NASA's Metacenter. The Metacenter is an exploratory

project that aims to make NASA supercomputers more readily available to researchers, thus providing quicker turn-around for batch jobs, a larger range of available resources for computation and better distribution of the computational workload across multiple supercomputers. Grid computing lets jobs be migrated between the systems based on load and by using a scheduling system called Portable Batch Systems.

"We are a research and development center as well as a provider of services to NASA, so we tend to get involved in promising technologies early or create them ourselves," Mehrotra says. "Before grid computing, NASA's resources were isolated from each other or clustered in small groups. This makes it difficult for users to use resources at multiple sites."

The team at aerospace manufacturer Boeing's Phantom Works research and development division also uses grid computing to pool and distribute resources. John Hurley, a senior manager at Boeing Phantom Works in Seattle, is responsible for distributed systems integration and managing the group that focuses on grid computing. His group uses grid computing between Boeing sites in Puget Sound, Wash., and St. Louis. The primary reason Boeing started working with grid computing five years ago was to cut costs, but the technology also helped Boeing balance computing resources between the two sites.

"Grid computing takes advantage of different resources at different sites and doesn't have any ownership or maintenance costs associated with it at the sites," Hurley says. "Very few industries rely on computing as much as we do. We have large problems that need to be dealt with in real time."

Boeing plans to expand the grid deployment to exploit the shared resources to load balance jobs among more locations and diminish bandwidth requirements on the network.

One obstacle Boeing faced in grid implementation was cultural more than technical. "It was a challenge to deal with a user community that was apprehensive about adopting a new way of computing, not just a new application," Hurley says. The organization overcame this problem by offering extensive training on the new system.

Hurley couldn't discuss the financial details of Boeing's grid investment. However, he says the deployment removes the costs associated with maintaining separate resources and prevents one site from monopolizing resources, which enables sharing resources among many sites. "We had to get people looking at the bigger picture, how can we integrate everything together to work for the company, rather than how do my resources support my job and my users," he says.

NASA's Mehrotra encountered similar obstacles. "One change was the amount of coordination needed between NASA organizations. This coordination is needed to manage the common grid deployed by the organizations to ensure that compatible versions of grid software are installed, problems reported by users are resolved and so on," Mehrotra says.

Aside from cultural issues, IT departments looking to adopt grid computing should be aware that the technology could become a "big ticket item" for companies not prepared to roll out grid applications, according to Hurley and Mehrotra. While grid is based mostly on deploying software applications that share resources on multiple systems, consistency and standardization is necessary across the infrastructure and other platforms supporting grid applications. Grid deployment also requires application code that supports parallel processing.

■ AEROSPACE: AT A GLANCE

- **Revenue:** The U.S. aerospace industry generated \$147 billion in sales during 2003, down 4% from 2002's \$153 billion, according to the Aerospace Industries Association. The organization forecasts that sales for 2004 will grow less than 1% to \$148 billion.
- **Workforce:** AIA reports that aerospace industry employment fell for its fifth straight year in 2003. Employment dropped 41,000 to 575,400 workers.
- **Spending:** NASA's discretionary budget for 2005 is \$16.2 billion.

Challenges aside, the two organizations will continue to work toward their goals for grid computing. "Our ultimate goal is that our users don't even notice that grid computing is there. They can simply perform their scientific simulations, access their data and accomplish their work using large and diverse pools of resources and services without knowing the complexities involved," Mehrotra says.

As for Boeing, the aerospace leader expects to see more commercial companies adopt grid computing in the near future.

"Grid has suffered with a reputation as a play tool for academics, but businesses are starting to recognize it's a viable product and technology," Hurley says.

AMR's Parker also expects to see more grid computing deployments, but not in its purest definition. Even today, aerospace companies are pooling inexpensive resources for specific tasks rather than rolling out an on-demand grid across their entire infrastructures. "But it is grid in that it's taking computing power off the desktop and centralizing it for economy, efficiency and mobility," he says. ■

CLEAR CHOICE

TEST

AirMagnet Distributed Version 4.0

A great way to monitor your WLAN

■ BY TOM HENDERSON, NETWORK WORLD LAB ALLIANCE

Our favorite wireless LAN analyzer from last year (www.nwfusion.com, DocFinder: 2522) now has a distributed version that uses a combination of proprietary access points and notebook-based sensors to help assess an 802.11 a, b or g area. Released last month, we recently tested Version 4.0 of AirMagnet Distributed, which seems to have solved some of the access point problems we found in an earlier version.

The product has an outstanding GUI and covers a breadth and depth of 802.11-specific problem areas for maintaining a dispersed WLAN. A tedious sensor-rollout method, a lack of an integral reporting mechanism and some other rough edges concern us, but overall this is a very good product.

About the system

AirMagnet Distributed includes four components: a management server that includes its own HTTP server (AirMagnet recommends dedicating a machine to it); a sensor (looks like an access point); the Distributed Console (a Windows-only application that organizes information from the AirMagnet Server application); and the reporting system.

Although similar to the Newbury Networks' Watchdog system (DocFinder: 2428), the AirMagnet Distributed system does not triangulate wireless equipment. Rather, distributed access point sensors

are deployed across the network, and can be delineated by floor, building and campus to articulate the physical location of errors or problems.

The system did a fine job of giving us wireless information, with only a few minor problems. Like the other AirMagnet products, the distributed system is a wireless-only analysis product; it won't cover wireline problems without assistance, such as wired protocol analyzers or intrusion-detection system applications.

Initial configuration of each sensor was necessary, one at a time, because each one comes from the factory with the same IP address. Each sensor covers all three 802.11 radio modes (a, b and g). It was easier to use the serial interface on the sensor to update addresses instead of configuring through the Web interface. We used four sensors in our tests, which let us cover 4,000 square feet on a one-floor building. The same sensors also were tested in a five-story building with the same coverage area (4,000 square feet).

The optional reporting software runs on a Microsoft SQL Server (a runtime license can be obtained if needed), and organizes the huge amount of data that the sensors can generate.

Listen to the air

The sensors have to find the Distributed Network Management Server through a private network or Internet VPN (anything through a direct route). Once configured, each sensor gets a software update from the management server if needed. Even on a wireless network filled with problems, the amount of data sent to the management server remains low, about a few thousand bytes per minute, per sensor.

Monitoring produces data in two categories: security and performance. The default settings indicate a "worry about everything" attitude, which we liked as a baseline.

We brought up the sensors in a local and VPN-emulated environment (we simulated a remote building scenario, see How we did it, DocFinder: 2533). Alerts



It might look like an access point, but the AirMagnet Distributed Sensor is listening for wireless data.

can be sent by e-mail, Short Message Service, telephone and Internet pages, sounds and instant messaging. We tested all the alerts except instant messaging.

The default settings produced an immediate deluge of information and alarms — even if a network is correctly configured for its feature set. Some of the information is trivial, such as the detection of an 802.11g access point that does not support smooth 802.11b-to-g transition. Many older access points don't do this, and even firmware updates won't help. It's possible to remove the detection of items such as this, so your logs don't fill up with essentially useless information.

The challenge with the system then is to find baselines and "normal" settings for a monitored network. Fortunately, the management console GUI is divided into a monitoring GUI and a policy/management GUI that gives highly articulate, though occasionally ambiguous, settings information about each possible monitoring attribute and condition. Understanding the settings requires in-depth knowledge of how 802.11-based network function. The ambiguity arises as some settings don't have good default values, because networks are so different.

For example, it is a good idea to watch for access points that go offline. It means there is a possibility that an area is not served, because an access point unavail-

able, it is rebooting, or it was nefariously substituted. There are many reasons that an access point goes offline, from power problems to people or objects interfering with the sensor's ability to detect a signal. For this reason, sensors need to be placed where they are unlikely to be blocked, to reduce false positives. This requires some fine tuning and periodic adjustment.

Security

The system can find many security problems. Our testing verified problems such as broadcasting an Service Set Identifier (SSID), the lack of Wired Equivalent Privacy, rogue access points (in 802.11a, b and g), ad hoc association attempts, session hijacking attempts, open authentication attempts and VPN verification (Point-to-Point Tunneling Protocol, Secure Shell and IPSec; Layer 2 Tunneling Protocol is supported but we used IPSec over L2TP and L2TP was undetected).

We also verified man-in-the-middle detection, six brands of access points for default configurations (D-Link Systems, Linksys, Netgear, Proxim, 3Com and Buffalo Technology), and an off-hour activity check. The off-hour check defaults are not monitored by time of day, but rather by SSID for local WLANs, neighboring WLANs and guest WLANs. We consider this a weak feature. Fortress encryption detection and monitoring is supported, but we chose not to test this.

The system also can detect 802.1X (authentication that uses RADIUS). We configured a Linux machine with Lightweight Directory Access Protocol and RADIUS, and the Temporal Key Integrity Protocol (TKIP) as used in the Wi-Fi Protected Access specification. The authentication server, running through a 3Com and Linksys access point, authenticated clients correctly. We configured the keys, which should change periodically, to never change — thus defeating TKIP. AirMagnet could not detect this, which is ostensibly monitored in a measured field called "802.1x rekey timeout too long."

Other attacks, such as a denial-of-service attack, including association and authen-

Net Results

AirMagnet Distributed Version 4.0

OVERALL RATING
4.2

Company: AirMagnet, www.airmagnet.com **Cost:** Starter kit includes four sensors, Management Server, Console: \$7,995; additional sensors, \$750 each; Reporter application, priced by number of sensors — up to 20 sensors, \$2,595; up to 50 sensors, \$4,995. **Pros:** Comprehensive; WLAN specific; very tunable. **Cons:** Reporter application is optional; a few small glitches.

The breakdown

Monitoring/analysis 40%	4.5
Performance 30%	4
Installation/administration 20%	4
Documentation 10%	4
TOTAL SCORE	4.2

Scoring Key: 5: Exceptional; 4: Very good; 3: Average; 2: Below average; 1: Good; 0: Poor

tication floods, all were detected correctly.

Performance

The system also could detect deployment/operations errors, 802.11a/b/g errors and inter-protocol usage errors between 802.11b and g, radio frequency management problems and "problematic traffic patterns." The system's frequency calibration was a bit off, which we verified with an oscilloscope and external time-base trigger. The system sometimes reports off-channel errors that aren't accurate, but the missed channel information was always close.

The system also found hidden stations — clients that can't hear other nodes and therefore collide with them by broadcasting over them. We used shielding to partition stations electrically and found that if the sensors could find them, they could determine whether the stations were colliding frequently (because they were therefore hidden from other stations' signals). The cure for this was to either move the access point that the node should associate with, or re-orient the client so it could detect other signals. This problem often happens when a node/machine sits on a desk near a steel filing cabinet or other wireless obstruction.

The system occasionally found high noise on a channel when a sensor was in close physical proximity to an access point. The sensors should be kept at least 9 feet from any client or access point, or false positives could be triggered. We made several adjustments to this threshold.

Documentation is relegated to a thin user's guide, and replaced by extensive and usually articulate on-screen help and prompts. In the management policy settings area, a wizard was helpful and somewhat complete, although it required a good base knowledge of WLANs.

Reporter

We were disappointed by the lack of an integrated report generator. While query-based, printed reports through the use of the Management Console are available as a pricey option (the Reporter app), and it is possible to use PrtScr to dump reports to a printer without Reporter (as well as export lots of data), we would have preferred an integrated report generator. When added, Reporter uses SQL Server, which adds administrative overhead to the usage process. On the plus side, Reporter installation after a SQL Server install was simple.

Another upside is that the reports are beautiful, simple to put together, and con-

tain easy-to-understand information for the technically inclined, and companies that require an audit trail. Without the Reporter system, AirMagnet Distributed is a lesser product.

Bottom line

AirMagnet Distributed excels in its GUI

and deep knowledge of 802.11-specific problems it can solve, and an overall ease of use to maintain a disperse WLAN. We liked its nervousness on the default settings, despite some inevitable fine-tuning of the alerts.

It does take a bit of work to deploy a fleet of sensors — both the initial config-

uration and deployment. Our biggest concern remains a lack of an integrated reporting system.

Henderson is managing director and principal researcher for ExtremeLabs. He can be reached at thenderson@extremelabs.com.

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Building your virtual team

Forging a consensus on the rules of engagement will make your group more effective.

■ BY CLAIRE SOOKMAN

Imagine the following scenario: Your New York travel firm is working with several telecom carriers to upgrade connections for a new online reservations system. The application vendor is in California, and your hotel and airline partners are distributed around the globe. You're having trouble integrating each firm's legacy applications, and the project is weeks behind deadline.

Does this type of challenge sound familiar? If you're an IT professional, the answer probably is yes. And you likely agree that a situation like that can have serious consequences. Is it possible to turn the situation around considering all the obstacles?

The answer is yes.

Let's take a moment to analyze this scenario. The team is geographically dispersed; and members face time zone challenges, cultural differences, possible language barriers, distance and a very frustrated team.

The IT environment tends to be intense, high-pressure and deadline-driven. If a

team is not functioning as a cohesive unit, addressing the numerous, complex technical issues in an effective manner will be frustrating at best. Think of the computer as an analogy; the best hardware is next to useless if the software is not compatible.

As a professional corporate trainer who has coached more than 1,000 project managers in North America, I have found that the most effective starting point when it comes to opening lines of communication is to create a team operating agreement. The goal is to combine the hard and soft aspects of project work in a unified way.

Put it in writing

A team operating agreement sets the rules of engagement for the way a team works together. It might include how people communicate as a team, what are acceptable meeting protocols and how people make decisions. However, this in itself is insufficient. To increase the likelihood of project success there needs to be a link to the actual project.

When your staff works in a virtual environment, it becomes even more critical for project teams to address the following four items:

- Commit to the scope of the project.
- Agree to time schedules.
- Recognize the risks involved.
- Agree to share information on a regular basis.

A team operating agreement guides a team's actions and interactions by describing the set of behavioral norms the team agrees to abide by. They can be formal or informal. If a team does not deliberately create them, they will develop on their own, which might be problematic. Norms that are not clearly defined and accepted by a team can lead to conflict, misunderstandings and, ultimately, reduced productivity.

Geographic, ethnic and cultural differences play a part of how effectively individuals and teams operate. Awareness of these differences is vital if communication is to be clear, honest and properly directed.

A team operating agreement helps a group in trouble because it clearly states what is expected of team members in relation to their own work and their responsibility to the team. This forged consensus eliminates ambiguity and second-guessing, prevents people from stepping on the toes of others and lets team members work more effectively. In the end, it solidifies trust and ensures team members are doing not only what best suits their particular talents but also taking an active role in team synergy.

A team operating agreement can be as inclusive as a team wants. The more inclusive it is, the less chance for miscommunication, conflict and lost opportunities. Ideally, it should be created at the beginning of a project or when a new team forms.

It could include these categories:

1. Meeting protocols.

- Our meetings begin and end on time.
- We attempt to schedule meetings to accommodate people in different time zones.
- We take into consideration holidays of the different cultures.
- We respect and listen to what other people are saying on the call and we don't hold more than one conversation at a time.
- We will give one week's notice to the team if a member is unable to attend.

2. Communication.

- We check e-mails twice a day.
- We have a no-scroll policy on all e-mails (one screen full).
- We call into the office once a day.
- We handle conflict directly with the person concerned and work to resolve it.
- We identify and communicate possible conflicts clearly and immediately.
- We give feedback in a timely manner, respecting cultural sensitivities.
- We value confidentiality.

3. Decision making.

- We select appropriate processes for making decisions.
- We identify the decision maker.
- We select appropriate processes for problem solving.
- We express ourselves freely.
- We have respect for each other's input, and we identify who has ownership of the task.
- We set achievable standards for task completion.
- We share information and knowledge willingly.

A team operating agreement can be very effective in focusing the energies and resources of an IT project team. By ensuring that all members work seamlessly on a human level, the prospect of devising solutions to complex technical issues under tight, stressful deadlines becomes much better.

Sookman is principal of Virtual Team Builders, an organization that specializes in helping geographically dispersed teams complete their projects on time and under budget. She can be reached at csookman@virtualteambuilders.com.

Cooperation commitment

A team operating agreement outlines how a virtual team works together. Take the following steps to implement one:

Brainstorm: Have each team member list what they would like to see become part of the team operating agreement.

List: Write each team member's ideas on a central flip chart.

Clarify: Ensure team members thoroughly understand each statement; encourage questions.

Discuss: Modify any statement, remove it, or live with it. Make sure you have buy-in from the entire team before moving ahead.

Send: E-mail a copy of the team operating agreement to the team or provide an electronic view of it.

Adopt: Follow what has been tabled as the "official" team operating agreement. Laminate it and display in a virtual meeting room.

Keep in mind that the team operating agreement is not a stagnant document. It can, and probably should, be modified during the course of a project.



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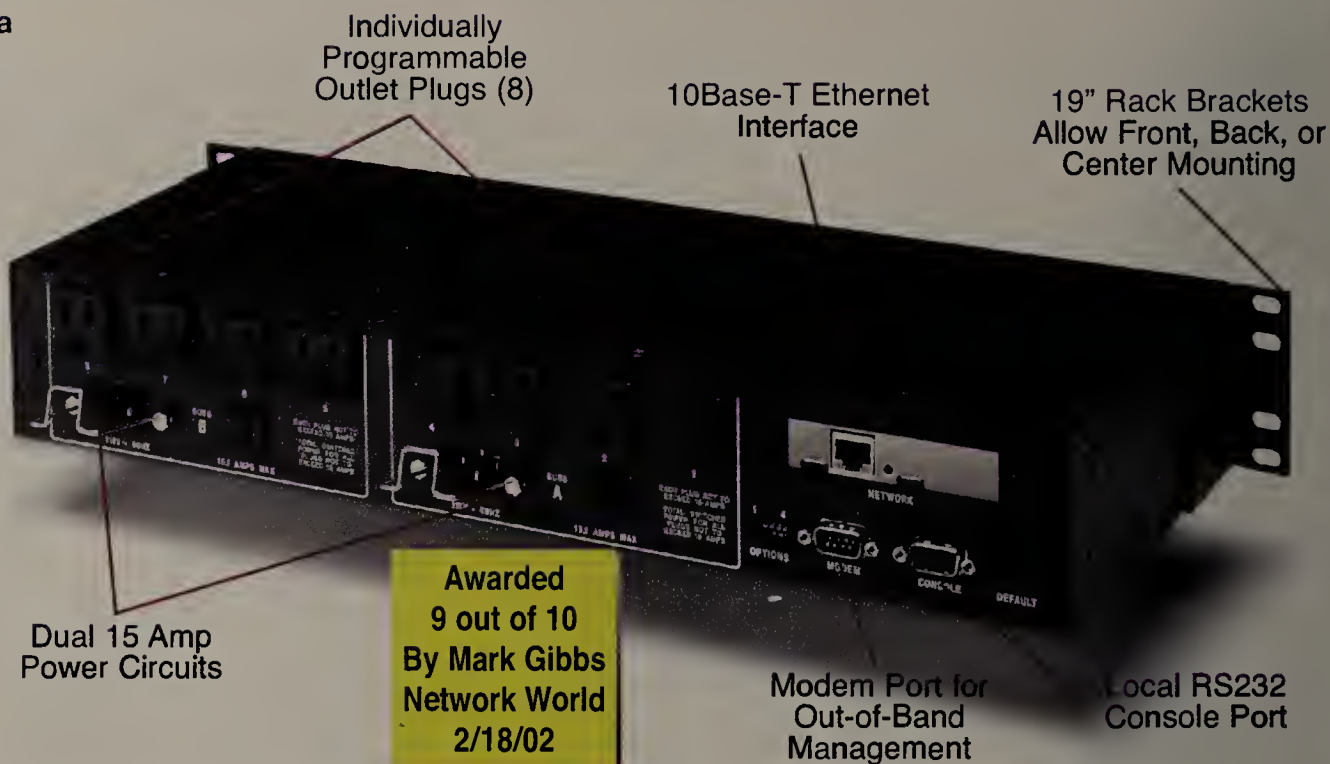
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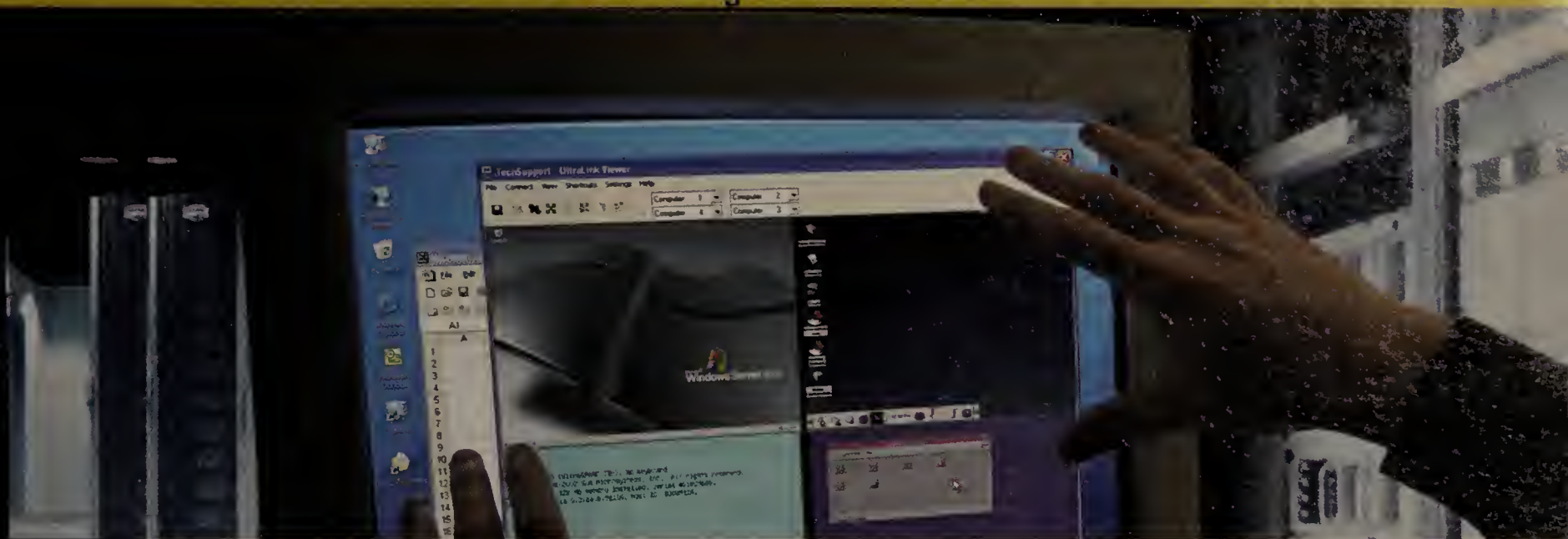
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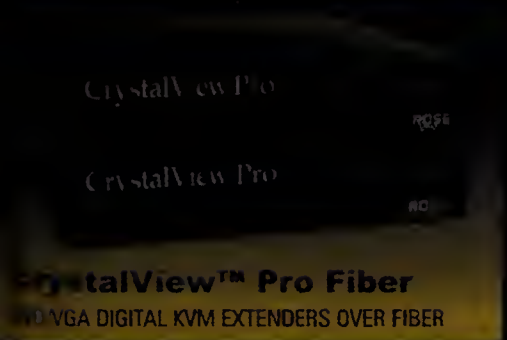
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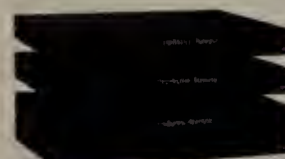
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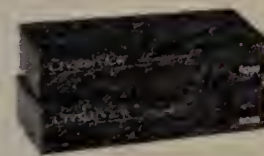
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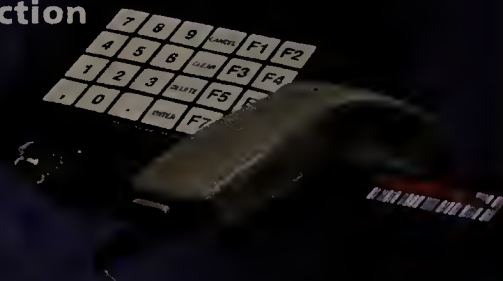
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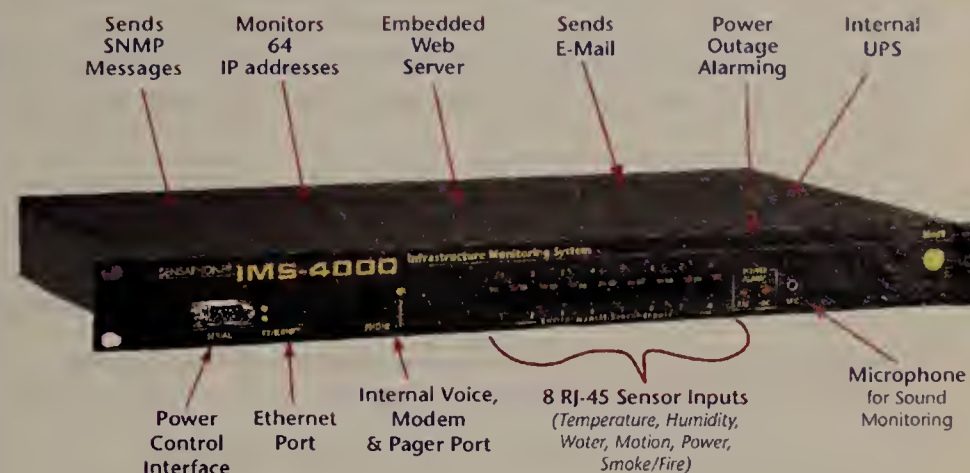
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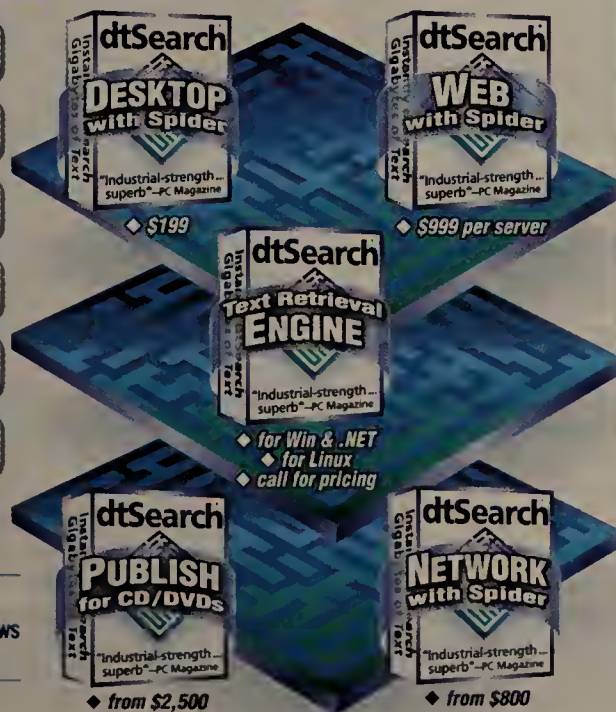
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- Home to the largest medical-related redevelopment effort in the country.

The combination, according to Metro Denver Economic Development Director Holli Baumunk, provides opportunity and challenge to IT workers. The new Fitzsimons Life Sciences City is a \$4.3 billion project to serve as the hub of research and development for the biotech industry. It will combine with the Lowry (formerly Lowry Air Force Base) and Stapleton (the former airport) redevelopment projects to create 70,000 new jobs spanning healthcare, biotech, medical device and pharmaceutical manufacturing.

Currently, the metro area has 3,106 software companies, the vast majority of which are small boutiques catering to unique needs. Pay is on par with other technology havens -- an average of \$90,390 annually for computer and information systems managers, and an average of \$78,160 annually for software engineers.

"While we're well known for our software development community," Baumunk says, "software crosses all of our industry clusters -- from financial to aerospace." Among the top employers in the area, Lockheed Martin Space Systems recently announced that rather than close its Deer Park facility, as had been planned, the company will redevelop the site for total occupation.

The Metro Denver area and state of Colorado have the nation's highest concentration of high tech workers. Now the rebound from 2002-2003 is under way with focus on growth in four areas -- biosciences, aerospace/defense, computer storage and peripherals and software publishing.



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SW Dev Engineer: Assist in the design, develop, coding, testing & debugging of new SW &/or maintaining or making significant enhancements to existing SW using C/C++, HTML/DHTML, Perl, CGI Script, JavaScript, SQL*Plus, PL/SQL, Oracle, VB, & Dev 2000 on Win NT, UNIX, & Sun Solaris op systems. Apply principles, theories & concepts & use methodologies, tools, documentation processes & test procedures to complete projects. Entry-level position working under close supervision of the SW Dev Mng. BS in Comp. Sci, Engin. or related field & 1yr. exp. & working/theoretical knowledge of C/C++, HTML/DHTML, Perl, CGI Script, JavaScript, SQL*Plus, PL/SQL, Oracle, VB, & Dev 2000 on Win NT, UNIX, & Sun Solaris op systems. \$67,200/yr. M-F. 40 hrs/wk. Denver, CO. Must have proof of legal authority to work permanently in U.S. Application by resume only to Workforce Development Programs, PO Box 46547, Denver, CO 80202. Ref job#CO5080592.

Network Engineer to design, develop, implement, and maintain enterprise networks using various Cisco routers, PIX Firewalls, switches, and VPN's to insure newly developed network systems accurately transfer and download complex financial information for real-time trading transactions originating from multiple telecommunication protocols including wireless, internet, and DSL using T1, T3, MAN networks and VPN tunnels. Prepares appropriate network and circuit testing procedures to determine modifications required based upon system parameters and unified interface integration with networked telecommunication protocols using technologies such as WildPackets' Etherpeek NX and Network Associates Sniffer. Requires Bachelor's Degree in Electronics, Electrical Engineering, or Electronics and Communications and one year direct experience. Work Location: Various unanticipated client sites. Send resumes only, no calls, to: Genome International Corporation, 583 D'Onofrio Drive, Madison, WI 53719.

COMPUTER Applications Programmer IV: Des, customize & implt SAP's SD, FI/CO, MM and WM modules. Des & dev interfaces between SAP & other appl's using ABAP/4, XML, IDOCs, BAPIs & Java. Provide 2nd level support for the SAP system in res production issues. Coordinate/lead global dev team/users to dev SW solutions based on SAP. Des & dev web appl's based on SAP's ITS technology. BS or equiv in Math, CS, Eng, or rel + 7 yrs exp in job offered or as Programmer, Developer, Prog Analyst, Tech lead or rel. Exp to incl: SAP ABAP dev (4 yrs);SAP web-enabling technologies; set up ITS server & enhancements; Des'g/dev'g Reports, Sap script, BDC, Dialog programs for SD, FI/CO, MM & WM modules; Des/dev interfaces from/to SAP & other appl's using IDoc, BAPI, RFC & ALE, EDI, Java & XML; SAP Variant config, classification, pricing conditions. Position is 40 Hrs Wk / \$90K/yr, located in Manchester NH. Send 2 copies of resume to: Job Box 2004-078, P.O. Box 989, Concord, NH 03302-0989.

Lead Web Developer: Provide tech leadership for design & devel of company website application using knowledge of C/C++, FORTRAN, HTML, SHTML, CGI, Visual C++, VB, Java, SQL, PL/SQL, Visual cafe, MatLab, Oracle, & UNIX & Win 95/NT op systems. Lead tech teams to interpret requirements & user interface specifications into app design & code. Analyze architectures as they relate to one another for max performance & scalability. Coordinate with test team, SW configuration mgmt, legacy application devel & vendors for SW installation, integration, testing & release. BS in Comp. Sci, Engin. or related field & 1yr. exp & working/theoretical knowledge of C/C++, FORTRAN, HTML, SHTML, CGI, Visual C++, VB, Java, SOL, PL/SQL, Visual cafe, MatLab, Oracle, & UNIX & Win 95/NT. \$98,000/yr. M-F. 40 hrs/wk. Denver, CO. Must have proof of legal authority to work permanently in U.S. Application by resume only to Workforce Development Programs, PO Box 46547, Denver, CO 80202. Ref job#CO5080772.

Internet company seeks Ph.D. Research Engineers responsible for innovative research. Interested applicants should send resumes to: K. Wolfe; 1600 Ampitheatre Parkway; Mt. View, CA 94043. Visit www.google.com for additional information.

Programmer Analyst: design /develop large scale infrastructure mgmt system utilizing OOD, C++/Visual C++, Java in a 3-tier client/server environ. on Win-2000/NT; write standalone executable & DLLs using MFC, Active X Control, & Win32 API to impl. communication b/t base class and appls.; design appls. w/ SOL to access/query client/server db incl. SOL Server, Oracle & Access via ODBC, DAO & ADO; and integrate FHWA recording/coding guide into bridge/street mgmt appls. Require BS in Comp.Sc. Full time. Resume to: Karen Backues, GBA Master Series, Inc. 10561 Barkley, Ste.500, Overland Park, KS 66212. NO CALL/EOE.

PROGRAMMER
 Alcorn State University seeks a qualified Programmer. Must have a Bachelor's degree or equivalent in Computer Science, Computer Engineering or related field. Experience must include 2 years in the position offered or 2 years of experience as a programmer/analyst. 40 hrs/wk. Must have legal authority to work in the U.S. Send Resume and cover letter to Napoleon Moses, Alcorn State University, 1000 ASU Drive, Lorman, MS, 39096.

Programmer/Analysts needed. Seeking qual. candidates possessing BS or equiv. and/or rel. work exp. Part of the req. rel. work exp. must include 2 yrs working w/ system analysis and design. Project management skills like project scheduling, monitoring and resource allocation is a plus. Duties include: test app. for ERP system adhering to the software development life cycle using Progress RDBMS/4GL in Linux & Windows platforms; Develop app. for key business areas: manufacturing, distribution, & financial. Send res., ref. & sal. req. to Jeld-Wen, Inc., 3303 Lakeport Blvd, Klamath Falls, OR 97601.

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COMPUTER

PricewaterhouseCoopers LLP's ABAS/HCP practice has opportunities available for experienced professionals in the area of Systems Analyst/Programmer. Positions require a bachelor's degree (master's preferred) in MIS or Bus. Admin. & 2 to 5 yrs related exp. Must have exp with data analysis & development using SAS, SOL & Oracle, software application (system) design & development exp & relational database & web application development exp. Job site/location: NY, NY. Interested candidates please reference job code 4PRNPB & fax resume to RD at 646-471-4415. No phone calls please. Employer will only consider applicants authorized to work for any employer in the U.S.

Database Administrator for Dayton, OH Healthcare Company to coordinate changes to corp. databases; analyze/design/develop/install/maintain computer software; schedule/review jobs and system performance; review backup/recovery strategy, disaster recovery planning, and long range database planning w/ Microsoft SQL; assist w/data-base design and modeling; develop models/designs for data warehouse/data store/data marts; Min Master's degree in Information System & 1 yr exp. req, including exp in the following areas: SQL 2000, Windows NT and 2000 SQL server, Visual Basic, TSQL, JSP; XML, HTML, VB.net. Resumes (no calls) to Erie Snell, One Dayton Center, One South Main Street, Ste. 900, Dayton, OH 45402. EOE.

Sr. Oracle Database Administrator (Jersey City): Install, configure, upgrade & tune Oracle d/bases on Solaris. Apply patches. Implmt & test disaster recovery plans. Replication & Data Modeling exp reqd. Knowl of Solaris Admin reqd. Must be certified as Oracle D/base Admin. Must have 5 yrs exp in Oracle d/base admin for fin'l institution. Must have BS in Comp Sci or equiv in education, exp or combo of the two. Send resume to Refco, 200 Liberty St, 23rd Fl, NY, NY 10281, Attn: J. Thaler

Computers-Programmer/Analysts needed. Seeking qual. candidates possessing BS or equiv. and/or rel. work exp. Duties include: Design, develop & test client/server software applications for various clients; Work with 3 of the following: JAVA, J2EE, ILOG JRules, WebSphere, Oracle, Weblogic. Fwd. resume & ref. to: Vennsys, LLC, Attn: HR, 5440 Willow Rd., #117, Waunakee, WI 53597.

Systems Analyst needed at client sites to dvlp client/server applics & ASP based secure Internet/Intranet applics, perform system reqmt analysis & construct doc using SSAD, DFD, & ERD, use RAD/Prototyping for dvlpmt, define Tier3 system reqmts, analyze & dvlp reqmts in CORBA & EJB interface & SOAP interface built on EJB layer. Send resume to: WebXL, 25 Airport Rd, Monistown, NJ 07960

SOFTWARE ENGINEER

Utilizing knowledge of database management to engage in the analysis, design, programming, debugging & modification of local, network or internet-related computer programs for commercial or end user applications such as materials management, financial management, HRIS or desktop applications products. Write code, complete programming & perform testing & debugging of applications using current programming language & technologies using Visual Basic & object-based programming. Complete documentation & procedures for installation & maintenance. May interface with users to define systems requirements and/or necessary modifications. Req: Master's deg in CS, CE, EE, Math, MIS, Physics, Business or any field plus 6 months experience as a SW Engr or in Database Admin/Mgmt, Systems Quality Control or rtd. Special Req: Knowledge of database mgmt, Visual Basic, & object-based programming. Sal: \$90,461/yr. Jobsite: Burlington, MA. 8am-5pm, 40hrs/wk. Send two (2) copies of your resume to: Case #200204200, Labor Exchange Office, 19 Staniford St, 1st Fl., Boston, MA 02114. Must have proof of legal authority to work in U.S.

S/W Engineers to design, develop apps using C++, Java, HTML, JScript, JDBC, XML, ASP, JSP, Visual Source Safe, SQL Server, Rational Rose, Oracle, Access under Windows/UNIX OS; perform system/functional req analysis; document detailed project specs and review conceptual model w/ users; provide training/user support for related appl software. Require: M.S. or foreign equiv. in CS/Engg. (any branch) with 1 yr exp in IT. Prog. Analysts to analyze, design apps using: C, VB, Java-Script, HTML/DHTML, EJB, JSP, ASP, Servlets, UML, Oracle, SQL under Windows OS; perform initial study of req and provide feedback; provide on site maintenance support, debug, modify, fine tune. Require: BS or foreign equiv. in CS/Engg. (any branch) & 2 yrs of exp. in IT. High Salary. Travel Involved. F/T openings in Elgin, IL, Lower Gwynedd, PA. Resume: HR, Fourth Technologies, Inc., 1108 N. Bethlehem Pike, Suite 8, Lower Gwynedd, PA 19002. Specify location desired.

Programmer Analyst. Will be responsible for Middleware Software Application life cycle (includes analysis, development, debug, testing) and business process/applications using IBM Websphere MQ Series and J2EE, C++, Visual Basic, JAVA, J2EE, Oracle, MSSQL Server. Bachelors Degree with 2 years experience required. Competitive wages, 40 hrs. a week. Please send one resume and cover letter to Attn: HR Manager, Integrated Business Group, 1325 Remington Rd., Suite K, Schaumburg, IL 60173.

NETWORK & SYSTEMS ADMINISTRATOR sought by IT consulting firm in Stafford, TX. Must have degree and exp. Respond by resume only to: K. Stephenson, Q/A#10, Systems Evolution Inc., 10707 Corporate Dr., Ste 156, Stafford, TX 77477.

IT PROFESSIONALS

Senior Consultant

(Glen Mills, Pennsylvania and other locations through the U.S.) Involved in the design and implementation of custom, technology enabled business solutions. Function as an integrator between business needs and technology solutions. Facilitate decision making process for the client business processes and participates in enterprise scalable/distributed systems implementation in defining systems strategy, developing systems requirements, designing and developing, testing, training and coordinating activities between various teams in the Architecture, Application Development, Infrastructure and Testing areas of client project implementation. Perform accurate analysis and effective diagnosis of client issues and manage day-to-day client relationships at peer client levels. Draft proposals on less complex engagement and identify engagement follow-on opportunities. Solve many disparate technical problems working in ambiguous situations and produce high quality solutions even in unstructured environments. Participate in web-based and portal development using Java, HTML JSP, ASP, VBScript, JavaScript and Plumtree Portal Server and work on design and development in Java/J2EE including EJB. Develop and deploy applications on Weblogic, IBM Websphere, Netscape/Planet Application Server, IIS and JRUN. Develop and administer databases including Oracle and SQL Server along with PL/SQL programming. Utilize development tools including ILOG JRules, Mercury LoadRunner, JBuilder, JDeveloper, IBM Visual Age for Java, Microsoft Visual Interdev, Crystal Reports, PVCS, Microsoft Visual SourceSafe, ERWIN and Visio.

The wage offered is \$78,000 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: *Bachelor's degree or equivalent in Computer Science, Math, Engineering (any), Information Systems or Business Administration + 4 years of experience in the job offered or 4 years of experience as a Senior Consultant, Software Engineer or Programmer Analyst. At least six months of related experience must include web based and portal technologies (JSP, HTML, Java, ASP, JavaScript, VBScript & Plumtree Portal Server), middleware technologies (J2EE & EJB), packages and products (Weblogic, IBM Websphere, ILOG JRules, Mercury LoadRunner, IIS, JRUN & Netscape/Planet Application Server), databases (Oracle and SQL Server with PL/SQL programming) and development tools (JBuilder, JDeveloper, IBM Visual Age, Microsoft Visual Interdev, Crystal Reports, PVCS, Visual SourceSafe, ERWIN & Visio).

*Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited educational evaluation service in the U.S.

Please send your resume, referencing Job Order Number WEB424963 to the: PA CareerLink, FLC Unit, 235 West Cheltenham Avenue, Philadelphia, PA 19144. EOE.

Software Engineers needed by Alpharetta based IT Co - Bachelors degree with 1-2 years of experience in job. Exp in Skill sets incl: Maintenance, Designing of Oracle Databases using OFA, loan balancing, Erwin, Migration Workbench, DBA Artisan, Spotlight, Toad 6.3, BMC Patrol for DB Monitoring, OAS, DBA Management, DB Assistant, OEM, Net8 configuration Assistant & tools associated with OEM. ODBC drivers, Oracle EBU 2.x, RMAN for backups, Omniback 3.0, SOL Forms 3.0, SQL Report writer 1.1, Forms 4.5, Reports 2.5. Send resumes to resumes@anisi.com. FREQUENT TRAVEL REQUIRED.

System Administrator: Maintain and troubleshoot customized computer database including ColorRx formulation; maintain and implement computerized accounting data reporting system; maintain client data files and monitor system configuration to ensure data integrity; develop, review, and implement interactive company website and email system. Requirements: BSc in Computer Science with proficiency in Windows XP, Database Concepts, HTML, Visual Basic, and Dreamweaver. 40hr/wk, 9 - 5. Send resume to David Besay, Paint Unlimited, Inc. @ 6125 Roswell Road, Atlanta, Ga. 30328.

Programmer Analysts to analyze, develop, maintain software apps using Oracle Applications, Oracle, PL/SQL, Dev 2000, etc under Windows/UNIX OS; conduct functional testing and debugging; perform data conversions, customize Forms/Reports using Oracle Applications standards; document, maintain & update development process. Require: BS or foreign equiv. in CS/Engg. (any branch) or related field & 2yrs of exp. in IT. Travel involved. F/T position. Competitive salary. Resume to: HR, Quest America, Inc., 211 East Ontario Street, Suite 1800, Chicago, IL 60611.

Director, Consulting & Implementation Svcs. Analyze business processes & configure s/ware products. Min 40 hrs/wk; salary competitive. MBA or equiv; 5 yrs exp in job offered or business process analysis or work mgmt consult position; 2 yrs utilizing MAXIMO. Located in W. Lafayette, IN; substantial travel req'd. Mail to RH Bowen, Job# 2692.01, 255 Elm St, Ste 300, West Somerville, MA 02144.

MULTI-MEDIA WEB DEVELOPER/DESIGNER (Tampa, FL) Design, develop, create web content for Web-based training, CD-ROM presentations, e-newsletters, Flash applications; programming and creation of animated interactions and GUIs; develop Flash Skins and interfaces connecting to databases. ENVT: ActionScript ASP XML HTML JavaScript. BS Visual Arts+ 2 yrs exp in job offered. Send resume w salary reqts to Paragon Computer Professionals, Dorothy M. Pfister, HR Director, 20 Commerce Dr, Suite 226, Cranford, NJ 07016.

Internet Developer E-Commerce - InterContinental Hotels Group is seeking qualified applicants for positions at the company's North American headquarters in Atlanta. Develop and maintain interactive and engaging web content and/or graphics as well as smaller-mid scale form applications/functions. Requires relevant degree and experience with ATG Dynamo and J2EE. Apply to Francene Taylor, Six Continents Hotels, Inc., Three Ravinia Drive, Suite 100, Atlanta, Georgia 30346.

Technical Director, Software: As Technical Director for the U.S. office of a company based in France, develop, perfect and troubleshoot software products in the "Enterprise Architecture Integration" (EAI) area; translate (French to English) and adapt as necessary technical documentation produced in France, evaluate technical feasibility of products in customer environment; technical validation of architectures where products are involved; consulting on technical aspects of software development projects; training of customers in France, Canada, the U.S. and elsewhere; implementation of training, support and pre-sales activities (in France, Canada and U.S.); support of U.S. and foreign customers and prospective customers using central support database in France; train members of the French and U.S. technical teams (support, pre-sales, etc.); provide technical presentations and demonstrations of company products at customers premises, trade shows and remotely; reproduce reported problems in French company lab to resolve problems in the US or escalate to the appropriate engineering team in France; communicate with other software professionals as well as upper management at company headquarters in France; recruit, train and manage a team for support, pre-sales and consulting activities. Lead team in developing, implementing and perfecting software products using and integrating, among other skills and technologies: Databases (Oracle: SQL programming/administration); Lightweight Directory Access Protocols (LDAP), e.g., iPlanet; Web-based operating environments; Java; design, implementation and administration of Graphical User Interfaces for Windows and Unix. Min reqts: Master's degree or equivalent in CS, Math, Oper. Research, Engineer, or closely related field plus 4 yrs exp in the job to be performed or 4 yrs of exp as a Relevant Software Develop. Manager position. The exp required must include at least 4 yrs exp in the integration of disparate technologies, include: software engineering & architecture design on the following platforms & technologies: Databases (Oracle: SQL programming/administration); Lightweight Directory Access Protocols (LDAP), e.g., iPlanet; Web-based operating environments; Java; design, implementation & administration of Graphical User Interfaces for Windows and Unix. Exp may be gained concurrently. Must be fluent in French. Job site: Burlington, MA. \$104,645/yr. M-F, 9-5, 40 hrs per week. To apply send 2 copies of resume to: Case #200204321, Division of Career Services, Labor Certification Unit, 19 Staniford St, 1st Fl., Boston MA 02114.

EMC Storage Administrator

Creation of storage volumes on EMC storage arrays utilizing Clariion, NAS and HP. Allocate storage to hosts on UNIX, NT and SGI platforms. Installation of HBAs in hosts involving HBA drivers and firmware. Oversee installation of software related to SAN Storage with Power Path and Secure Path. Migration of hosts from one storage array to another using either EMC SRDF or other host-based migrations involving Veritas Volume Manager or Windows 2000 mirroring options. Perform required zoning, ECC administration and maintain SAN fabric. Troubleshoot complex problems such as HBA failure and path failure on the hosts. Job location in New London, CT. Req. 3 years previous exp. Apply to: BLC Consulting, 26 Jefferson Court, Wethersfield, CT 06109.

Sr. Programmer/Analyst wanted to define new systems and enhancements to existing systems and prepare internal design and programming specifications. Bachelor's degree in computer science or computer engineering and 2 years experience required. Send resume to Kentucky Farm Bureau Mutual Insurance Company, P. O. Box 20700, Louisville, KY 40250-0700, Attn: Human Resources.

Seeking qualified applicants for the following positions in Memphis, TN: **Senior Business Systems Analyst** Develop major applications systems requirements, testing and controls. Requirements: Bachelor's degree or equivalent* in business, computer science, engineering, mathematics, MIS or related field, plus 5 years of experience in systems planning and design or systems development and integration. Experience with mainframe systems support, invoicing/revenue testing, and writing and executing test plans and test scripts also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to David Hanks, Federal Express Corporation, 3680 Hacks Cross Road, Bldg H, 1st Floor, Memphis, TN 38125. EOE M/F/D/V.

Software QA Lead Leading QA consulting firm seeks individual to implement and improve the quality validation process of complex point of sale, e-commerce, client server and mid-range security applications for clients in Lakeland, FL and other unanticipated locations. Individual must possess BS+3 yrs web testing, prior QA lead exp. and comprehensive exp. in developing test plans, test cases and procedures as well as execution of manual and automated tests. Submit res. and refs. to D. Morton, SQA Associates 125 Whipple St, Providence, RI 02908. No calls.

COMPUTER SECURITY PricewaterhouseCoopers LLP's Advisory practice has opportunities available for experienced professionals in the area of Computer Technology Security. Positions require a bachelor's degree (master's preferred) in CS, CIS or MIS & 1-5 yrs related exp. Additional qualifications needed include exp with security and control issues for various technologies including UNIX, Windows NT/2000, Cisco Routers and Firewalls, exp with intrusion detections; hands-on technical exp with penetration testing, computer forensic investigations, security policy development; and risk assessment. Travel required. Job site/location: San Francisco, CA. Interested candidates please reference job code 4NXXMZN & fax resume to DJD at 813-329-3919. No phone calls please. Employer will only consider applicants authorized to work for any employer in the U.S.

Software Engineer sought by a provider of personal driving records info in Rancho Cordova, CA. Must have BS or BE & 2 yrs s/ware exp. Resume to Attn: HR Dept., American Driving Records, Inc., 2860 Gold Tailings Ct., Rancho Cordova, CA 95670.

Computer Professionals (programmer, system analyst, software engineer) wanted by Bralak Technologies to develop applications using VB, Webtech, Oracle, Java, SQL, Java, etc. Candidates must have at least BS degree with IT exp. Please send resumes to recruiter@bralak.com. EOE.

Comp Consults is looking for programmer/system analysts, engineers or IT consultants to design & develop programs using Oracle, Unix, C/C++, VB, Java, J2EE, EJB, XML, XSL/XSLT. Min requirement is BS plus experience. Please send resumes to immig@compconsults.com. EOE. No calls.

Software Dev. Co. req. Software Engineer w/MS & 1yr exp. & Programmer Analyst w/BS & 24 mos. exp. in foll: Visual Basic, Oracle, PowerBuilder, Sybase, Java, Unix, C++, AS/400, SQL Serv, Synon, Cobol, Lotus Notes, SAP, ABAP, BW, FICO, BASIS, PEOPLESFT, CRM, HRMS, Financials, Java Script, HTML, DB2, Corba, CICS, ILE, RPG, EJB, Siebel, JD Edwards, WebLogic, Rational Rose. Equiv. Deg. & exp also accepted. Travel & Relocation req. anywhere in U.S. Send res. to Attn: Recruiter, Allied Informatics, Inc, 2797 Prairie Ave., Suite 16, Beloit, WI 53511.

Operation Manager: Will evaluate clients' requirements, software needs of the users and potential clients and devising suitable solutions conjunction with client's technical personnel. Will be responsible for all project management activities and selection of Programmer/Analysts, Application developers, Database administrators, Quality Assurance testers etc., to the projects. Will develop project plans for offshore execution, liaison and providing support for the company's marketing activities, etc. Master's Degree with 3 to 6 months experience required. Competitive wages, 40 hrs. a week. Please send one resume and cover letter to Attn: HR Manager, Integrated Business Group, 1325 Remington Rd., Suite K, Schaumburg, IL 60173.



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Guinness

continued from page 1

"Times have changed. We're still tracking remarkable feats in the living world, but we no longer keep records for hunting tigers on safari, for example, and a lot of the gluttony records are out. Meanwhile, cyberhistory is being taken more seriously," says Hawksett, who boasts of having copies of the world's first JPEGs on his computer.

It's not that the 50th anniversary edition isn't celebrating the sensational as well as the more serious. It's just that Hawksett has his focus. Among the new Internet-related entries is the record for the largest networked chess system, which earlier this year tapped the power of 2,070 computers in 50-plus countries to take on a Danish grandmaster (the match ended in a draw after 34 moves). Last week, Hawksett was busy trying to verify a claim for the world's highest-capacity router. Also being considered is a claim by ACT Teleconferencing and customer Herbalife that in March they smashed erstwhile presidential candidate Howard Dean's record for the greatest number of participants in a conference call

Record breakers

The Internet, communications industry and computing are making their mark in the *Guinness World Records* book, as this sampling shows:

- **Largest Internet café:** EasyEverything in Times Square, home to 648 computer terminals.

- **Smallest telephone:** Jan Piotr Krutewicz in 1996 created a working phone measuring 1.8 by .03 by .08 inches.



EasyEverything

- **Largest single e-commerce transaction:** Business tycoon Mark Cuban spent \$40 million on a Gulfstream V jet in 1999.



Gulfstream V

- **Longest telephone cable:** FLAG, or Fiber-optic Link Around the Globe, which runs for 16,800 miles from Japan to the U.K.

- **Earliest JPEG:** The original images, from 1987, are known as "Boat," "Barbara," "Toys" and "Zelda."

SOURCE: GUINNESS WORLD RECORDS 2004

by topping the 10,000 mark.

Hawksett, who can view the world's tallest observation wheel (a sort of Ferris wheel called the London Eye) from his eighth-floor office in London, says the rise of the Internet has resulted in a corresponding increase in network-related records worthy of inclusion in the Guinness book.

Guinness gets pounded with roughly 100,000 inquiries about new records per year, fewer than

5% of which are accepted in a process that can take anywhere from hours to months. The publication, which is produced by a team of about 10 writers and editors, keeps mounds and mounds of records in an electronic database, far more than can be squeezed into the book each year.

Hawksett says he doesn't have hard numbers on how many of the inquiries relate to his beat, but 20-plus items fill the Internet section of the 2004 paperback edition, including the largest Internet café (EasyEverything's spot in Times Square) and the earliest e-mail (Ray Tomlinson's message sent in 1971). In addition, another 40-plus entries fall under technology and communications headings. There wasn't even an Internet section before the 1996 edition, Hawksett says.

Record holder Bill Cheswick says he and cohort Hal Burch, while at Bell Labs in the late 1990s, never envisioned that the massive cyberspace map they designed would land them in the Guinness book alongside the world's most accomplished fire-breathers and yodelers. Cheswick says he suspects the colorfulness of the map, not just the 88,000 endpoints highlighted in the book, is what caught the publisher's eye.

"It's fun to be in there, though it's not like I have it on my [résumé] — though now that I think about it, maybe I should," says Cheswick, a noted network security author and currently chief scientist at Lumeta, a company that grew out of his Internet mapping work.

Hawksett says tracking tech

records is a huge challenge, partly because many record holders don't think to contact him and because of the constantly changing nature of technology. A record might be broken several more times in the span of a year. For example, the Internet2 consortium keeps Hawksett abreast of what the group calls the land speed record for whisking data across IP networks.

Harvey Newman, professor of physics at the California Institute of Technology, and his team, along with a group from CERN, earned a spot in the 2004 book by sending 6.7G bytes of data — "equivalent to nearly two feature-length DVD movies" according to Guinness — across 6,821 miles of network between California and The Netherlands in less than a minute.

"We already beat our records by a significant margin. We will submit these soon," he writes. "We are approaching the PCI-X bus theoretical speed limit of 8.5G bit/sec. So the rate of progress will [temporarily] slow down. We can always extend the distance, and we will, but that will just gain another factor of order two to three over where we are now. Eventually we will circle the earth, in not too long."

In general, academic-oriented research is fairly easy to track by working closely with institutions such as Caltech and leading labs, says Hawksett, who uses his background in astrophysics and planetary science to help him sort through highly technical submissions.

But tracking record feats in the IT industry is another story. "The professionals in that industry just

don't usually think to contact us. They don't think in terms of superlatives," says Hawksett, who plows through technical journals and travels abroad several times a year to discover and substantiate new records.

The notion that IT product vendors shy away from superlatives might come as a surprise to anyone in the industry who has been through a product pitch, but Hawksett insists he could use help from the network industry in identifying record-breaking events and technologies. He encourages those with proposals to visit www.guinnessworldrecords.com. He's currently thinking about how to measure the biggest wireless LAN, for example.

Some proposed records are just too vague to verify, such as the longest telephone call or the most threads on an online discussion board, Hawksett says.

Others have become taboo. While the latest edition of the book recognizes a 1983 self-replicating software program as the first computer virus, Hawksett stresses he wants to keep other virus records out.

"The last thing we need is to find out some 17-year-old wrote a virus in hopes of getting into the Guinness book and winds up doing \$10 billion of damage in the process," he says.

Editor's note: The author of this story set the world record for endurance yo-yoing in the mid-1980s and was recognized in the book for several years before being topped. He has no plans to recapture the record.

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Security

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CSOs talk phishing, perimeter defense

In a nearby meeting, dubbed CSO Interchange, 85 chief security officers convened. The event was organized by eBay CSO Howard Schmidt with help from vulnerability-assessment vendor Qualys.

Schmidt singled out phishing attacks, in which spam lures victims to fake Web sites, as a growing menace to e-commerce. But he said modifications to Web browsers could help address the threat.

"What the browser lacks today is site validation," said Schmidt, formerly the U.S. cybersecurity czar. EBay is working with Microsoft on altering Internet Explorer in a way that should make it clear to any potential victim that he has reached a fraudulent Web site. Schmidt said he expects Microsoft to complete this browser change by year-end.

CSO Interchange included a lively exchange among CSOs on topics ranging from the effect of regulation to combating worms, and featured a presentation by Paul Simmonds, global information security director with ICI, a European chemical and paint manufacturer.

Simmonds described how a mostly European user group called The Jericho Forum (among its 30 large corporate participants are BP, GlaxoSmithKline and Royal Dutch/Shell) is defining an architecture for e-commerce based on the idea that the firewall- and IDS-based perimeter needs to give way to something radically different.

Although attendees found the idea of "de-perimeterization" intriguing, they expressed concern, such as about the cost of data encryption and the idea of giving up firewalls.

Simmonds said the group is still defining its architecture, but anticipates soon being able to approach IT vendors interested in meeting the needs of the corporations involved.

He said he hopes more U.S. companies — Boeing is already a participant — join the effort. ■

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BackSpin Mark Gibbs



The complexity of e-mail retention

Continuing in my role as the Greek chorus of the e-mail world ("Woe is us, woe is us") I have spent the last two weeks getting you worried about what your users write in their messages and the problems of monitoring. I finished last week by asking, "But what about e-mail retention? How long should you keep e-mail around?"

I asked my e-discovery expert, Elizabeth Charnock of Cataphora, her advice about corporate retention policies.

My first question was the obvious one: Why is an e-mail retention policy important?

Charnock's answer: "Despite the old chestnut about consistency being the hobgoblin of small minds, there is a practical reality that a very well-defined e-mail retention policy that is consistently executed is next to impossible to challenge in the event of any kind of litigation. Let's say a company deletes all e-mails from its mail servers automatically on the last day of each month. Anyone showing up with a subpoena for electronic data on the first of the month is then out of luck, at least with respect to items that existed only on such servers."

Charnock went on to point out: "If, on the other hand, like Frank Quattrone [former head of Credit

Suisse First Boston's technology investment banking business, who looks like he will be doing time for financial chicanery] you suddenly decide one day that you ought to remind your employees about your not very well-enforced retention policy, you are opening yourself up to the accusation that this reminder was motivated by fear or certain knowledge of specific events. Leaving the door even a crack open with respect to allegations of selective 'end of living' of data is an unnecessary and foolish business risk."

Asked what a good, general retention policy would be, Charnock says "it depends on the needs and characteristics of the business. There is no one-size-fits-all policy."

She points out that regulatory issues aside, some key issues to consider are:

- How bad is it if e-mails accidentally are deleted as a side effect of enforcement of the policy? Are there regulatory issues? Compliance issues? Other issues? Other costs?
- Can the end users of greatest relevance to the matter being investigated reasonably be expected to manage important information on a continuous basis? If not, can they be expected to reliably segregate important information before a reminder of automated "sweeping" of the mail servers?
- Is the business one that gets sued frequently? Is

e-mail monitored on an ongoing basis for issues ranging from compliance violations to inappropriate behavior?

Charnock says, "The ultimate question is, all things considered, in the case of the individual business, what system of retention yields the highest ROI and/or least risk."

Given that disk space is getting less expensive every year, keeping everything forever is feasible and, indeed, being done in practice. Is that a good idea?

She reckons it probably isn't: "The cost isn't much of a motivator, obviously, but the best case is that, apart from litigation, old archived information is unlikely to ever be resurrected. Of course having it around for litigation is a double-edged sword, but one side is usually much sharper than the other. So it is very hard to find much upside in such a strategy, but there are some downsides — at least some costs, and possibly a really large downside if the company is issued an incredibly broad subpoena that they can't manage to negotiate downward."

In other words, once you've exercised your common sense about your e-mail retention policy you'll probably need to talk to an expert to make sure you are managing your risk as effectively as possible.

Next week, who knows? If you do, drop a note to backspin@gibbs.com.



'NetBuzz News, insights, opinions and oddities

By Paul McNamara

Spam takes a holiday

Last week the Federal Trade Commission tossed its bureaucratic hands skyward and confessed an utter inability to deliver a workable "Do Not Spam" list of the kind envisioned by lawmakers last year when they passed CAN-SPAM.

Such a list was always a pipe dream designed for political consumption, so the FTC's concession shouldn't have come as a shock.

However, a *Network World* reader might have stumbled upon a genuinely effective way of reducing the overall volume of spam: Give government employees more holidays. Jack O'Callaghan, systems officer at Martha's Vineyard Co-operative Bank, explains:

"I've got some PCs here at work with ancient e-mail clients that I cannot filter for spam. I found it most interesting that today, a day when most state and federal offices were closed out of respect for President Reagan's funeral, I saw a huge reduction in the amount of spam messages I received. I'd say it was about one-quarter to one-third of the normal volume . . . really!

"Now I know the government shutdown affected a whole lot of computers, but this seems out of proportion, no? I'm only half kidding when I suggest that perhaps the government needs to do a much better job of ensuring that employee's PCs are virus-free and not being used as spam relays. I'd be interested in your thoughts and if anybody else has had a similar experience to mine today."

Well, I suppose it's possible that a whole bunch of high-volume spammers were moved to suspend operations out of respect for Reagan. After all, spammers are known to be a respectful and courteous lot.

Then again, it could be that a whole bunch of government employees moonlight as spammers using taxpayer-funded machines and networks. Making ends meet on a government paycheck can be a stretch.

Wall Street was also closed on that Friday, which might explain . . . well, I don't

know what it explains; I just toss it out there. Any theories?

What's wrong with this picture?

Technology marches ever onward, never in reverse, right? Not so.

Witness the Sprint PCS Vision Smart Device Treo 600 by palmOne, which after you bust through all that marketing gobbledygook is a high-end cell phone/PDA. The thing does almost everything you'd want a handheld to do, and one thing some corporate security professionals would rather it not do: take pictures.

Which prompted Sprint to jam the Treo into reverse.

"Since the launch of the original Treo 600 in 2003, Sprint has received significant feedback from business customers interested in a non-camera version, particularly from customers in the manufacturing, financial services and government segments," a Sprint spokeswoman says. "Policies vary, but range from prohibiting camera phones in certain areas to complete bans on the premises."

Sprint declined to speculate as to what percentage of Treo buyers will choose the non-camera version, but one might guess that it will be popular among those who also have health club memberships, since a growing number of such facilities are banning camera phones as well.

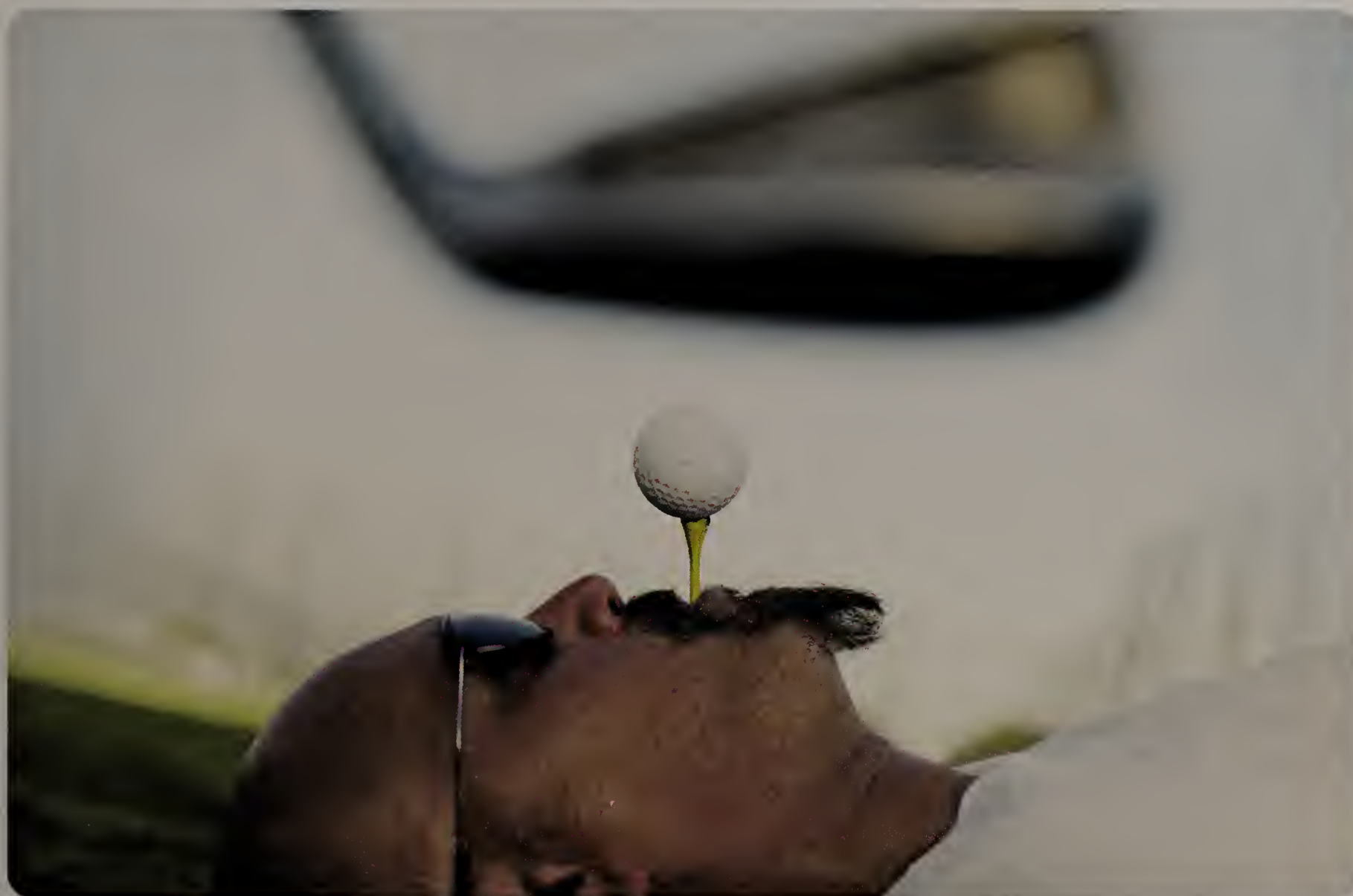
Curiously, the non-camera version of the Treo will cost exactly the same — \$600 — as the fully loaded model. Why is that?

"While there is some reduction in manufacturing costs as a result of removing the camera, the device does still include the picture software that will allow users to download and share pictures with Sprint PCS Picture Mail," the spokeswoman explains. "Additionally, there are also expenses Sprint has incurred with revising the production lineup of the original device."

In other words, technological regression does not come without costs.

For the last time: You can't have my cell phone number. The e-mail address is buzz@nww.com.

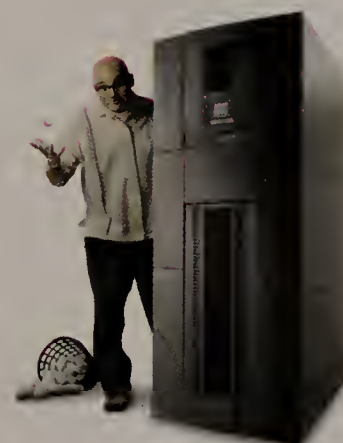
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